MITSUBISHI ELECTRIC

Mitsubishi Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R C Controller Module User's Manual(StartUp)

-R12CCPU-V

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully, and pay full attention to safety to handle the product correctly.

In this manual, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

⚠ **WARNING**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ **CAUTION**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Considerations for using this manual]

- Replace the terms used in the following pages in this manual with the terms shown on the right, respectively.
  Corresponding page: SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, and COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES
  (1) "Programmable controller" → "C Controller module"
  (2) "Programmable controller system" → "C Controller system"
- For details on a fail-safe circuit for C Controller module, refer to the following manual.
  📖 MELSEC iQ-R C Controller Module User's Manual (Application)

[Design Precautions]

⚠WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.
  (2) When the programmable controller detects an abnormal condition, it stops the operation and all outputs are:
    • Turned off if the overcurrent or overvoltage protection of the power supply module is activated.
    • Held or turned off according to the parameter setting if the self-diagnostic function of the CPU module detects an error such as a watchdog timer error.
  (3) All outputs may be turned on if an error occurs in a part, such as an I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to "General Safety Requirements" in the MELSEC iQ-R Module Configuration Manual.
  (4) Outputs may remain on or off due to a failure of a component such as a relay and transistor in an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.
- In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to manuals relevant to the network. Incorrect output or malfunction due to a communication failure may result in an accident.
- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data to the "system area" and "write-protect area" of the buffer memory in the module. Also, do not use any "use prohibited" signals as an output signal from the CPU module to each module. Doing so may cause malfunction of the programmable controller system. For the "system area", "write-protect area", and the "use prohibited" signals, refer to the user's manual for the module used.

[Design Precautions]

⚠WARNING

- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Incorrect output or malfunction due to a communication failure may result in an accident.
- To maintain the safety of the programmable controller system against unauthorized access from external devices via the network, take appropriate measures. To maintain the safety against unauthorized access via the Internet, take measures such as installing a firewall.

[Precautions for using C Controller modules]

- In refresh parameter settings, the device Y cannot be specified for the link output (LY) refresh device or the remote output (RY) refresh device. Therefore, C Controller module holds the device status as is even after the module status is changed to STOP.

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- During control of an inductive load such as a lamp, heater, or solenoid valve, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Therefore, use a module that has a sufficient current rating.
- After the CPU module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration, parameter settings, and/or program size. Design circuits so that the entire system will always operate safely, regardless of the time.
- Do not power off the programmable controller or do not reset the CPU module while the settings are being written. Doing so will make the data in the flash ROM undefined. The values need to be set in the buffer memory and written to the flash ROM again. Doing so may cause malfunction or failure of the module.
- When changing the operating status of the CPU module from external devices (such as remote RUN/STOP functions), select "Do Not Open in Program" for "Open Method Setting" in the module parameters. If "Open in Program" is selected, an execution of remote STOP causes the communication line to close. Consequently, the CPU module cannot reopen the communication line, and the external device cannot execute the remote RUN.

[Installation Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Precautions for using C Controller modules]

- Do not mount C Controller module on the right end of the base unit.
  Attach a blank cover module (RG60) to prevent entrance of foreign material such as dust when no module is mounted on the right side of C Controller module.

[Installation Precautions]

⚠CAUTION

- Use the programmable controller in an environment that meets general specifications written in Safety Guidelines included in the base unit. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount a module, place the concave part(s) located at the bottom onto the guide(s) of the base unit, and push in the module until the hook(s) located at the top snaps into place. Incorrect interconnection may cause malfunction, failure, or drop of the module.
- When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
- Tighten the screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- When using an extension cable, connect it to the extension cable connector of the base unit securely. Check the connection for looseness. Poor contact may cause malfunction.
- When using an SD memory card, fully insert it into the memory card slot. Check that it is inserted completely. Poor contact may cause malfunction.
- Securely insert an extended SRAM cassette into the cassette connector of a CPU module. After insertion, close the cassette cover and check that the cassette is inserted completely. Poor contact may cause malfunction.
- Do not directly touch any conductive parts and electronic components of the module, SD memory card, extended SRAM cassette, or connector. Doing so may cause malfunction or failure of the module.

[Wiring Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before installation and wiring. Failure to do so may result in electric shock or cause the module to fail or malfunction.
- After installation and wiring, attach the included terminal cover to the module before turning it on for operation. Failure to do so may result in electric shock.

[Wiring Precautions]

⚠CAUTION

- Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100 ohms or less. Failure to do so may result in electric shock or malfunction.
- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Check the rated voltage and signal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause fire or failure.
- Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered. Incomplete connections may cause short circuit, fire, or malfunction.
- Securely connect the connector to the module. Poor contact may cause malfunction.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact. Do not clamp the extension cables with the jacket stripped.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the module and external device.
- Tighten the terminal screws or connector screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, fire, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.
- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- Programmable controllers must be installed in control panels. Connect the main power supply to the power supply module in the control panel through a relay terminal block. Wiring and replacement of a power supply module must be performed by qualified maintenance personnel with knowledge of protection against electric shock. For wiring, refer to the MELSEC iQ-R Module Configuration Manual.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual for the module used. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Correctly connect the battery connector. Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire. Also, do not expose it to liquid or strong shock. Doing so will cause the battery to produce heat, explode, ignite, or leak, resulting in injury or fire.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws, connector screws, or module fixing screws. Failure to do so may result in electric shock.

[Startup and Maintenance Precautions]

⚠CAUTION

- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller. Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
- Tighten the screws within the specified torque range. Undertightening can cause drop of the component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module, and do not insert/remove the extended SRAM cassette to/from the CPU module more than 50 times (IEC 61131-2 compliant) respectively. Exceeding the limit may cause malfunction.
- After the first use of the product, do not insert/remove the SD memory card to/from the CPU module more than 500 times. Exceeding the limit may cause malfunction.
- Do not touch the metal terminals on the back side of the SD memory card. Doing so may cause malfunction or failure of the module.
- Do not touch the integrated circuits on the circuit board of an extended SRAM cassette. Doing so may cause malfunction or failure of the module.

[Startup and Maintenance Precautions]

⚠CAUTION

- Do not drop or apply shock to the battery to be installed in the module. Doing so may damage the battery, causing the battery fluid to leak inside the battery. If the battery is dropped or any shock is applied to it, dispose of it without using.
- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

[Operating Precautions]

⚠CAUTION

- When changing data and operating status, and modifying program of the running programmable controller from an external device such as a personal computer connected to an intelligent function module, read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
- Do not power off the programmable controller or reset the CPU module while the setting values in the buffer memory are being written to the flash ROM in the module. Doing so will make the data in the flash ROM undefined. The values need to be set in the buffer memory and written to the flash ROM again. Doing so can cause malfunction or failure of the module.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.
- When disposing of batteries, separate them from other wastes according to the local regulations. For details on battery regulations in EU member states, refer to the MELSEC iQ-R Module Configuration Manual.

[Transportation Precautions]

⚠CAUTION

- When transporting lithium batteries, follow the transportation regulations. For details on the regulated models, refer to the MELSEC iQ-R Module Configuration Manual.
- The halogens (such as fluorine, chlorine, bromine, and iodine), which are contained in a fumigant used for disinfection and pest control of wood packaging materials, may cause failure of the product. Prevent the entry of fumigant residues into the product or consider other methods (such as heat treatment) instead of fumigation. The disinfection and pest control measures must be applied to unprocessed raw wood.

CONDITIONS OF USE FOR THE PRODUCT

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

CONSIDERATIONS FOR USE

Considerations for the Wind River Systems product

C Controller module has an embedded real-time operating system, VxWorks, manufactured by Wind River Systems, Inc. in the United States. We, Mitsubishi, make no warranty for the Wind River Systems product and will not be liable for any problems and damages caused by the Wind River Systems product during use of C Controller module.
For the problems or specifications of the Wind River Systems product, refer to the corresponding manual or consult Wind River Systems, Inc.
Contact information is available on the following website.

- Wind River Systems, Inc. www.windriver.com

INTRODUCTION

Thank you for purchasing the Mitsubishi MELSEC iQ-R series programmable controllers.
This manual describes the performance specifications, procedures up to operation, wiring, and communication examples to use the module listed below. Before using the product, please read this manual and relevant manuals carefully and develop familiarity with the performance of MELSEC iQ-R series programmable controller to handle the product correctly.
When applying the example programs provided in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.
Please make sure that the end users read this manual.

Relevant product

R12CCPU-V

COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES

Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- 📖 MELSEC iQ-R Module Configuration Manual
- 📖 Safety Guideline (included in Base unit)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

Additional measures

To ensure that this product meets the requirements of the EMC and Low Voltage Directives, compliance with the noise immunity standards for Ethernet cable, RS-232 cable, and USB cable is required.

■Ethernet cable

For a twisted pair cable to be connected to the connector of 10BASE-T/100BASE-TX/1000BASE-T, use a shielded twisted pair cable.

■RS-232 cable

For RS-232 cable, be sure to ground the shield part of a shield cable.

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R C Controller Module User's Manual (Startup) [SH-081367ENG] (this manual)	Explains the performance specifications, module startup procedure, and troubleshooting of C Controller module.	Print book e-Manual EPUB PDF
MELSEC iQ-R C Controller Module User's Manual (Application) [SH-081369ENG]	Explains the functions, devices, and parameters of C Controller module.	Print book e-Manual EPUB PDF
MELSEC iQ-R C Controller Module Programming Manual [SH-081371ENG]	Explains the programming specifications and dedicated functions of C Controller module.	e-Manual EPUB PDF
CW Workbench/CW-Sim Operating Manual [SH-081373ENG]	Explains the system configuration, specifications, functions, and troubleshooting of CW Workbench/CW-Sim.	e-Manual EPUB PDF
CW Configurator Operating Manual [SH-081382ENG]	Explains the system configuration, parameter settings, and operation methods for the online function of CW Configurator.	e-Manual EPUB PDF

This manual does not include detailed information on the following:

- General specifications
- The number of mountable modules
- Installation environment and mounted position of the module

For details, refer to the following manual.

MELSEC iQ-R Module Configuration Manual

Note that the following terms in the left column shall be replaced with the one in the right column.

Term	Replaced term
Programmable controller	C Controller module
Programmable controller system	C Controller system

- Dedicated function library (C Controller module dedicated functions, MELSEC data link functions)

For details, refer to the following manual.

MELSEC iQ-R C Controller Module Programming Manual

Point

e-Manual refers to the Mitsubishi FA electronic book manuals that can be browsed using a dedicated tool.
e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.

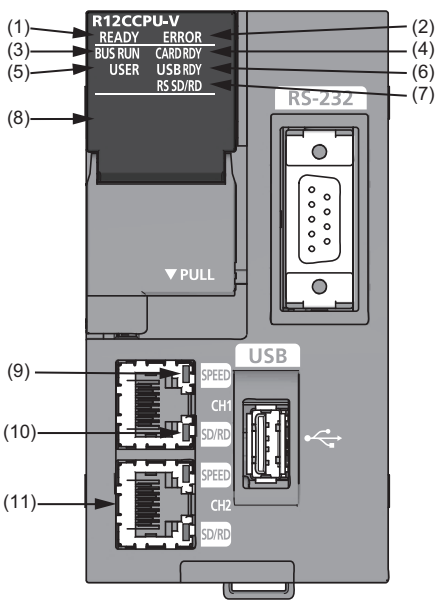
TERMS

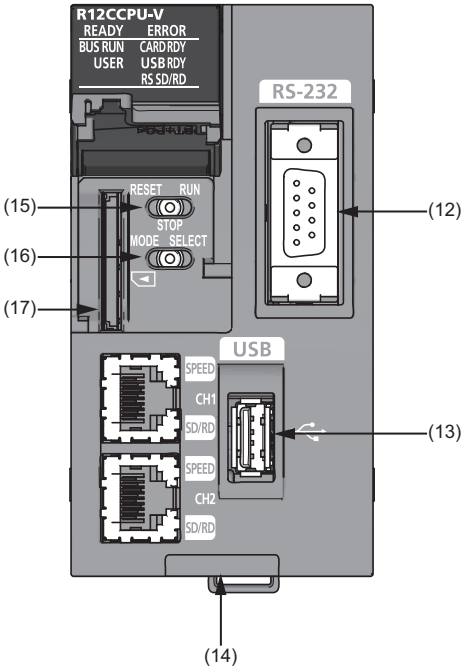
Unless otherwise specified, this manual uses the following terms.

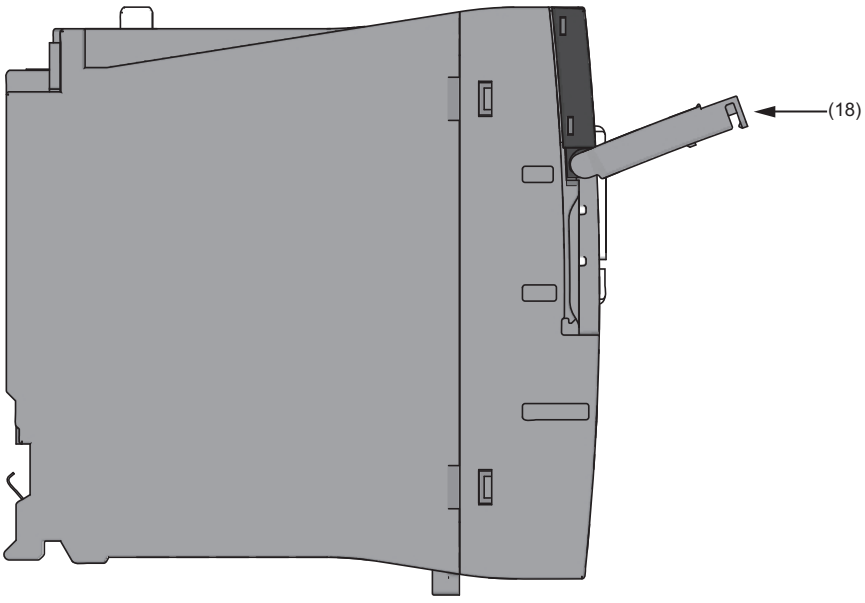
Term	Description
Base unit	A generic term for the main base unit, extension base unit, and RQ extension base unit
C Controller module	A generic term for MELSEC iQ-R series C Controller module
C Controller module dedicated function	A dedicated function library offered by C Controller module It controls C Controller module.
CPU module	A generic term for MELSEC iQ-R series CPU module
CW Configurator	A generic product name for model names, SWnDND-RCCPU ('n' indicates version.)
CW Workbench	An abbreviation for Engineering tool for C Controller module, CW Workbench
CW-Sim	An abbreviation for VxWorks simulator that can operate and debug the C Controller module programs on a personal computer with CW Workbench installed, without connecting to the actual machine (target)
Dedicated function library	A generic term for C Controller module dedicated functions and MELSEC data link functions
GOT	An abbreviation for the Mitsubishi Graphic Operation Terminal
I/O module	A generic term for input module, output module, I/O combined module, and interrupt module
Intelligent function module	A generic term for modules which has functions other than input and output, such as A/D converter module and D/A converter module
MELSEC data link function	A dedicated function library offered by C Controller module It is used to access other CPU modules as a connection target via network or in a multiple CPU system.
Network module	A generic term for the following modules: • CC-Link module • CC-Link IE Controller Network module • CC-Link IE Field Network module
Power supply module	A generic term for MELSEC iQ-R series power supply module
R12CCPU-V	An abbreviation for R12CCPU-V C Controller module
SD memory card	A memory card that is compliant with the SD standards designed and developed by the SD Association
Target device	A generic term for a personal computer, GOT, other CPU modules, and others connected to CPU module for data communication
USB Mass Storage Class-compliant device	A USB device that is compliant with the standard for recognizing as a memory device (USB Mass Storage Class)
VxWorks	A product name for the real-time operating system manufactured by Wind River Systems, Inc.

1 PART NAMES

This chapter explains the part names of C Controller module.







No.	Name	Description
(1)	READY LED	Indicates the operation mode. ON: Normal operation mode Flashing (low-speed): Initial processing (Executing the script file, "STARTUP.CMD") OFF (for normal operation): Hardware failure occurred or resetting OFF (for diagnostic mode): Hardware diagnostic mode
(2)	ERROR LED	Indicates the error status. ON: A continuation error occurred or a major error occurred Flashing (for normal operation): A stop error occurred Flashing (for diagnostic mode): A hardware diagnostic error or initialization error occurred OFF: Normal operation
(3)	BUS RUN LED	Indicates the operating status. ON (for normal operation): RUN state (State where output (Y) from a user program and writing to the buffer memory are permitted) ON (for diagnostic mode): Hardware diagnostic mode Flashing (low-speed): Performing the hardware diagnostics, configuring the module initialization setting, or performing initialization Flashing (high-speed): Program/data memory shutdown completed status OFF : STOP/PAUSE state (State where output (Y) from a user program and writing to the buffer memory are prohibited)
(4)	CARD RDY LED	Indicates the availability of SD memory card. ON: Accessible status (Mounted status) Flashing: Mount processing or unmount processing OFF: Inaccessible status (Not inserted or unmounted status)
(5)	USER LED	The indication can be controlled with a user program.
(6)	USB RDY LED	Indicates the availability of USB Mass Storage Class-compliant device. ON: Accessible status (Mounted status) Flashing: Mount processing or unmount processing OFF: Inaccessible status (Not installed or unmounted status)
(7)	RS SD/RD LED	Indicates data transmission/reception status of the RS-232 interface. ON: Transmitting/receiving data OFF: Not transmitting/receiving data
(8)	Dot matrix LED	Displays the settings or results for the operation selection mode or hardware diagnostic mode. The display can be controlled with a user program during the normal operation.
(9)	SPEED LED	Indicates the communication speed and link status for Ethernet. ON (orange): Linking-up (1000 Mbps) ON (green): Linking-up (100 Mbps) OFF: Linking-down or linking-up (10 Mbps)
(10)	SD/RD LED	Indicates data transmission/reception status with Ethernet. ON: Transmitting/receiving data OFF: Not transmitting/receiving data
(11)	Ethernet port	Port for connecting with Ethernet-supported devices
(12)	RS-232 connector	Connector for connecting with RS-232 supported devices
(13)	USB connector	Connector for connecting with USB-supported devices
(14)	Product information marking	Displays the production information (16 digits) of the module.
(15)	RESET/STOP/RUN switch[*1]	A switch to operate the hardware operating status RUN: Changes the operating status of the module to RUN. (Status where output (Y) from a user program and writing to the buffer memory are permitted) STOP: Changes the operating status of the module to STOP. (Status where output (Y) from a user program and writing to the buffer memory are prohibited) RESET: Resets the module. The switch operation for each operating status is shown below. For initialization ☞ Page 39 Initialization For hardware diagnostics ☞ Page 41 Performing Hardware Diagnostics For operation selection mode ☞ Page 48 Switch Operation
(16)	MODE/SELECT switch[*1]	A switch to select the hardware mode The switch operation for each operating status is shown below. For initialization ☞ Page 39 Initialization For hardware diagnostics ☞ Page 41 Performing Hardware Diagnostics For operation selection mode ☞ Page 48 Switch Operation

No.	Name	Description
(17)	SD memory card slot	A slot to insert an SD memory card
(18)	Slot cover*2	A cover for the SD memory card slot and switches Open this cover to insert/remove an SD memory card or to operate the switches.

*1 Operate the switches by fingertip. Using tools such as a screwdriver may cause damage on the switches.

*2 Close the cover unless inserting/removing an SD memory card or operating the switches to prevent foreign material intrusion such as dust.

2 SPECIFICATIONS

The performance specifications of C Controller module are shown below.

Item			R12CCPU-V
Hardware	Endian format		Little endian
	MPU		ARM® Cortex-A9 Dual Core
	Memory capacity	Work RAM	256 MB
		ROM	12 MB
		Backup RAM*1	4 MB
Software	Operating system		VxWorks Version 6.9
	Programming language		C language (C/C++)
SD memory card slot	Interface		SD/SDHC memory card (Up to 16 GB)
	Power supply		+3.3 VDC, up to 200 mA
Ethernet port	Number of channels		2
	Interface		10BASE-T/100BASE-TX/1000BASE-T
	Communication method		Full-duplex/half-duplex
	Data transmission speed		10 Mbps(10BASE-T)/100 Mbps(100BASE-TX)/1000 Mbps(1000BASE-T)
	Transmission method		Base band
	Maximum segment length		100 m (distance between hub and node)
	Applicable connector for external wiring		RJ45
	Supported function		Auto-negotiation function (automatic recognition of communication speed/ communication method)
			Auto-MDI/MDIX (automatic recognition of straight/crossing cable)
	IP version		IPv4 supported
RS-232 connector	Number of channels		1
	Interface		RS-232-compliant
	Communication method		Full-duplex/half-duplex
	Synchronization method		Asynchronous communication
	Transmission speed		9600, 14400, 19200, 28800, 38400, 57600, 115200 bps
	Transmission distance		Up to 15 m
	Data format	Start bit	1
		Data bit	7/8
		Parity bit	1/None
		Stop bit	1/2
	Parity check		Yes (Even/Odd)/None
	Sum check code		Yes/None
	Transmission control		Flow control (RS/CS control)
USB connector	Interface		USB 2.0-compliant
	Connector		Type A
	Transfer speed		480 Mbps (High Speed)
	Power supply		Bus power +5 VDC, up to 500 mA*2
	Complied standard		USB Mass Storage Class (Up to 2 TB)
Number of input/output points			4096 points (X/Y0 to FFF)
Clock function	Displayed information		Year, month, day, hour, minute, second, day of week (automatic leap year detection)
	Precision		Daily error : -5.86 to +3.35 seconds (0 to 55 ℃) Daily error: -1.71 to +3.35 seconds (25 ℃)
Allowable momentary power failure time			Depends on the Power supply module.
5 VDC internal current consumption			1.26 A*3
External dimensions			106 (H) × 56 (W) × 110 (D) mm
Weight			0.35 kg

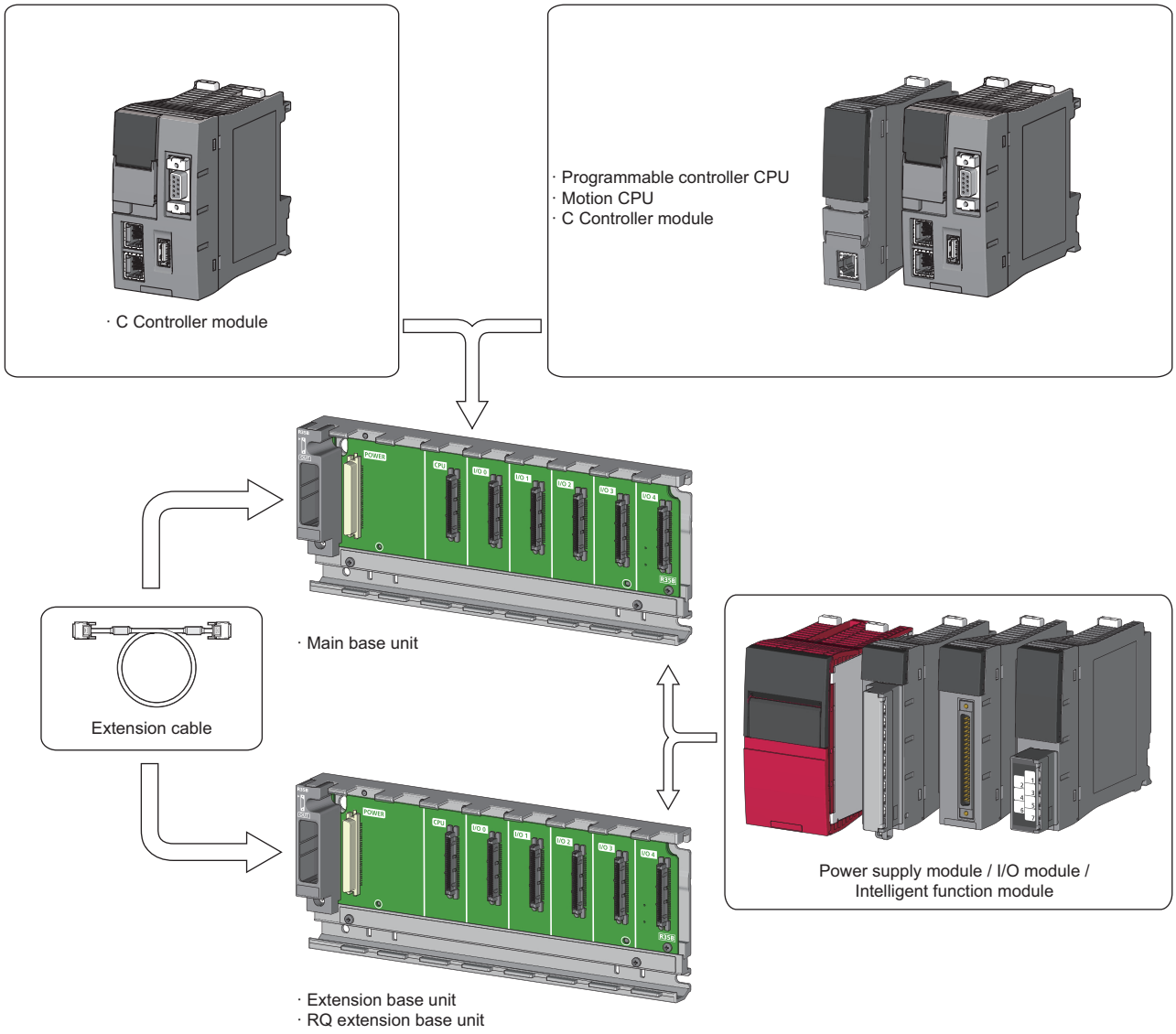
*1 A file storage area in the device/label memory. For details on the memory configuration, refer to the following manual.
MELSEC iQ-R C Controller Module User's Manual (Application)
*2 Select appropriate USB Mass Storage Class-compliant devices to be connected to observe the current consumption limit.
*3 The current consumption of USB is not included.

3 SYSTEM CONFIGURATION

This chapter describes the overall configuration and considerations for system configuration of C Controller system.

3.1 Overall Configuration

The overall configuration of C Controller system is shown below.


· C Controller module
· Programmable controller CPU
· Motion CPU
· C Controller module
· Main base unit
Extension cable
Power supply module / I/O module /
Intelligent function module
· Extension base unit
· RQ extension base unit

Point

Configure the system properly by observing the considerations. (☞ Page 21 Considerations for system configuration)

Considerations for system configuration

The following describes the considerations for configuring the system.

System configuration specification

Item		Description
Mounting position of a module		Slot number 1 to 63
Maximum number of mountable modules	Single CPU system configuration	63[*1,*3]
	Multiple CPU system configuration	57 to 62[*1,*2,*3]
Maximum number of extension base units		7[*4]
Total extension cable length		20 m[*5]

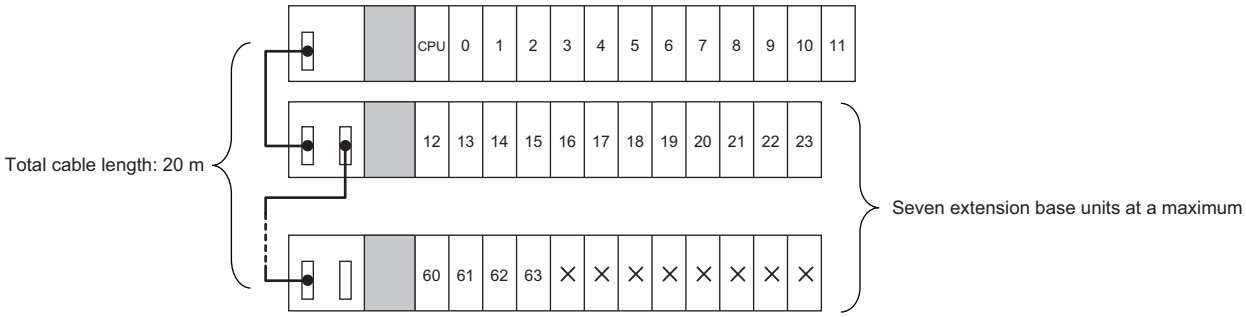
*1 Mount modules within the range of the number of I/O points for the C Controller module used. (☞ Page 18 SPECIFICATIONS)

*2 Modules can be mounted up to slot number 63 starting from the slot next to the one on which C Controller module at the right end is mounted. For example, when four C Controller modules are mounted on the CPU slot and slot number 0 to 6, the maximum number of mountable modules is 57.

*3 The number of mountable modules includes the empty slots. Even if the number of I/O points is set to '0' for an empty slot, the slot is counted as one module.

*4 This is the total number of extension base units, RQ extension base units, and MELSEC-Q series extension base units.

*5 When a MELSEC-Q series module is used in the system, the total cable length is 13.2 m.


CPU 0 1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22 23
60 61 62 63 × × × × × × × ×
Total cable length: 20 m
Seven extension base units at a maximum

Modules with restrictions on the number of mountable modules

The modules which have the restriction on the number of mountable modules are shown below.

Item	Maximum number of mountable modules	
	Single CPU system configuration	Multiple CPU system configuration
• CC-Link IE Controller Network module	8	32
• CC-Link IE Field Network module • CC-Link IE built-in Ethernet interface module	8[*1]	32[*1]
• CC-Link module	8	32[*1]
• Interrupt module (MELSEC-Q series)[*2]	1	4

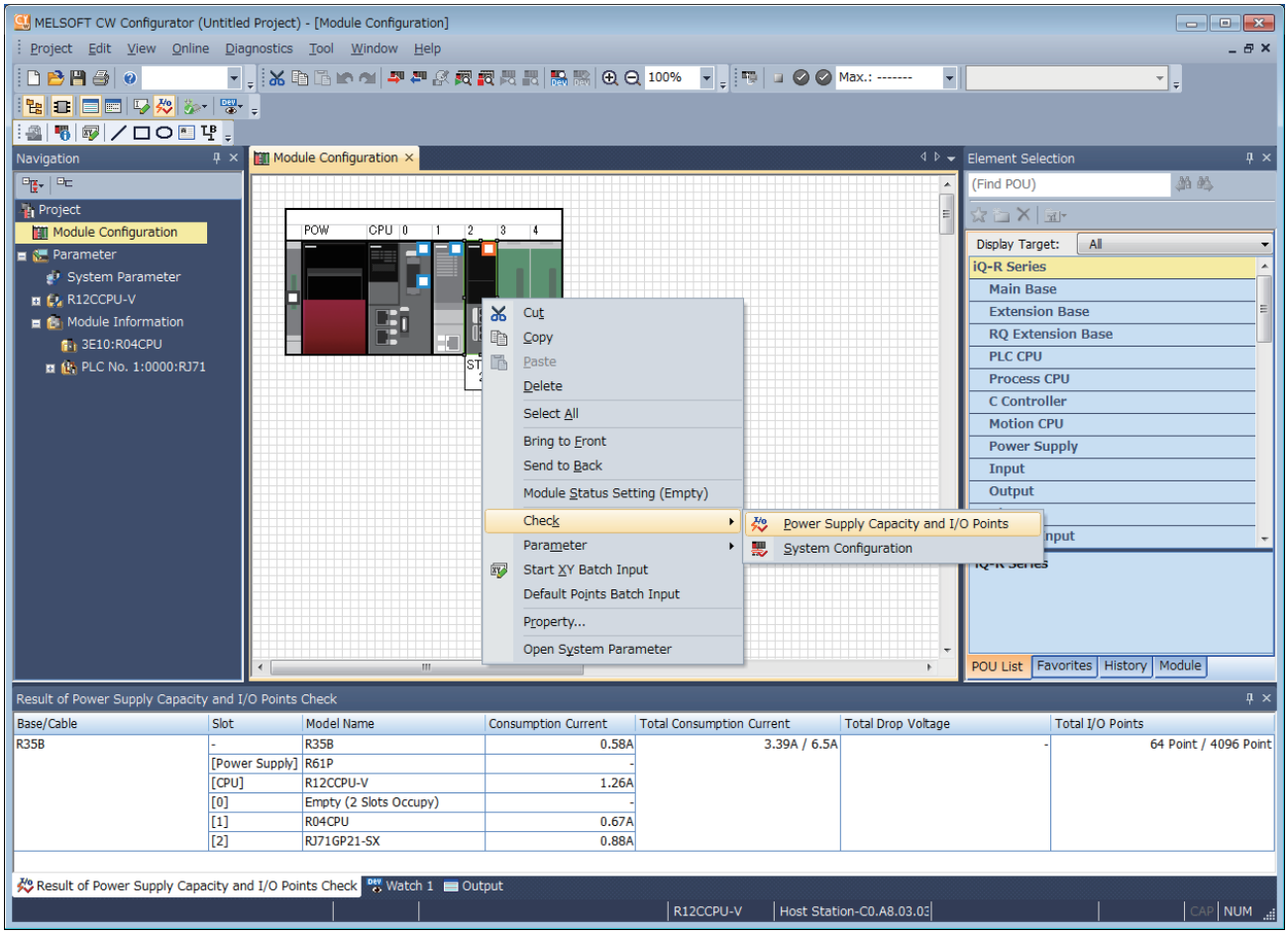
*1 When selecting a module of which setting is configured with the dedicated instruction from Module Configuration Diagram, there is no restriction on the number of mountable modules.

*2 When setting an interrupt pointer to be used with CW Configurator, there is no restriction on the number of mountable modules. Up to 64 modules can be mounted.

Consideration for internal current consumption

Consider the system to be used so that the internal current consumption of the entire system is less than the rated output current of Power supply module.

The total internal current consumption can be checked with CW Configurator.

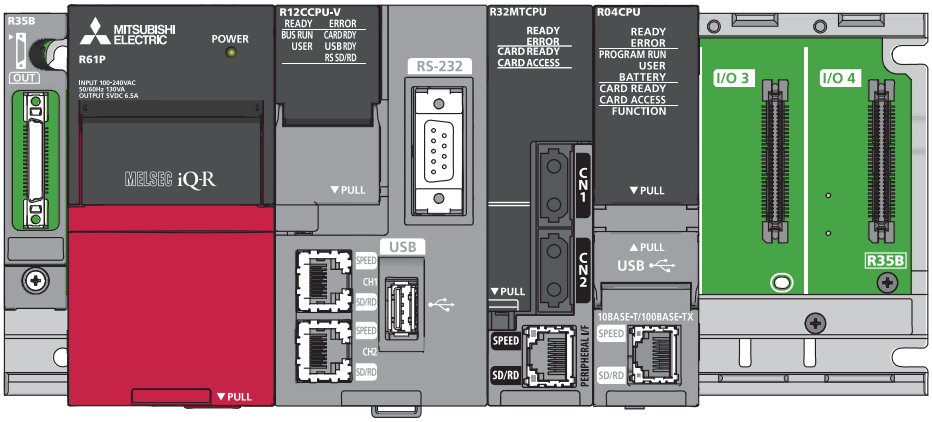


3.2 Multiple CPU System Configuration

In this configuration, multiple CPU modules are mounted, and individual CPU module controls I/O module and Intelligent function module.

For more details on multiple CPU system, refer to the following manual.

MELSEC iQ-R Module Configuration Manual



Supported CPU module

Following are the CPU modules which can be used to configure a multiple CPU system in combination with C Controller module.

CPU module	Model
Programmable controller CPU	R04CPU, R08CPU, R16CPU, R32CPU, R120CPU
Motion CPU	R16MTCPU, R32MTCPU
C Controller module	R12CCPU-V

Restriction

A multiple CPU system cannot be configured when programmable controller CPU controls any of the following Intelligent function modules:

- RJ71EN71 (CCIEC)
- RJ71EN71 (E+CCIEC)

Combination of CPU module

Combination in a multiple CPU system is as follows.

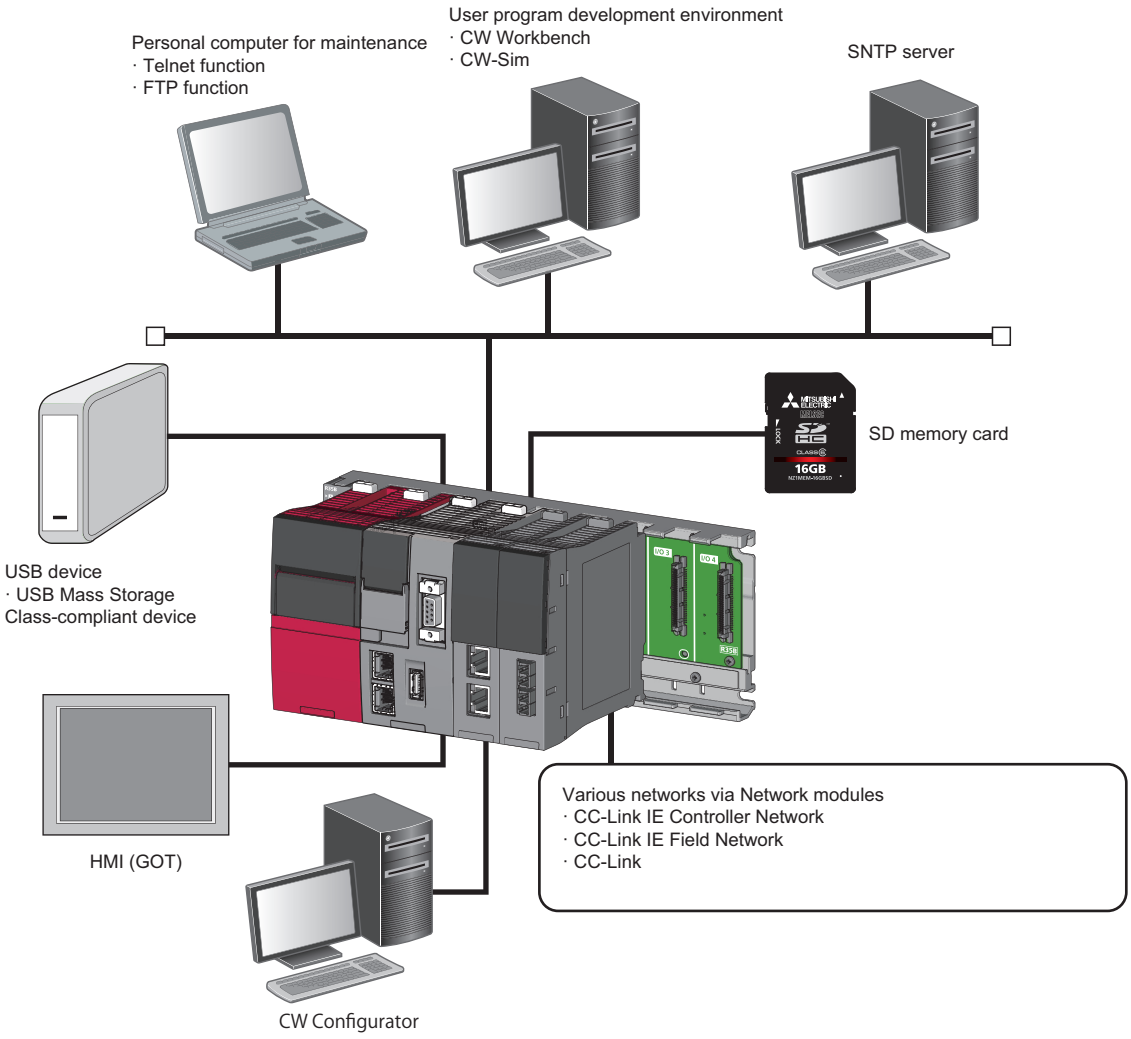
For details on the combination of CPU modules other than C Controller module, refer to the manual for respective CPU modules.

—: Not available

CPU No.1	Number of mountable CPU modules for CPU No.2 and later		
	Programmable controller CPU	Motion CPU	C Controller module
Programmable controller CPU	MELSEC iQ-R Module Configuration Manual User's manual for relevant CPU modules		0 to 3
Motion CPU			—
C Controller module	0 to 3	0 to 3	0 to 3

3.3 Peripheral Configuration

The configuration with peripherals is shown below.



Point

- USB devices can be used for C Controller module with the firmware version '03' or later.
- Insert or connect peripherals to C Controller module so that the specifications of both C Controller module and peripherals are met.
- For information on the access via each Network module and the access using Ethernet communication, refer to the following manual.

MELSEC iQ-R C Controller Module User's Manual (Application)

3.4 Supported Software Package List

This section describes all software packages associated with C Controller module.

Software package		Version
CW Configurator	SW1DND-RCCPU-J	Version 1.00A or later
	SW1DND-RCCPU-E	
CW Workbench	SW1DND-CWWR-E/EZ/EVZ	Version 1.00A or later
CW-Sim	SW1DND-CWWSIMR-EZ	Version 1.00A or later
CW-Sim Standalone	SW1DND-CWWSIMSAR-E	Version 1.00A or later
Wind River Workbench	—	Version 3.3
GX Works3	SW1DND-GXW3-J	Version 1.007H or later
	SW1DND-GXW3-E	
GT Designer3	SW1DNC-GTWK3-J	Version 1.126G or later
	SW1DNC-GTWK3-E	
MT Works2	SW1DNC-MTW2-J	Version 1.110Q or later
	SW1DNC-MTW2-E	

3.5 Supported Module List

This section shows the system configuration devices supported by C Controller module.

Point

For the dedicated instructions of respective modules, which can be executed by C Controller module, refer to the following C Controller module dedicated functions. (MELSEC iQ-R C Controller Module Programming Manual)

- CCPU_DedicatedDInst
- CCPU_DedicatedGInst
- CCPU_DedicatedJInst
- CCPU_DedicatedMInst

The following dedicated instruction can be executed to C Controller module from respective modules.

- D(P).GINT
- M(P).GINT

MELSEC iQ-R series

The following table lists configuration devices in the MELSEC iQ-R series system.

Module		Model	Function version
Base unit	Main base unit	R35B, R38B, R312B	—
	Extension base unit	R65B, R68B, R612B	—
	RQ extension base unit	RQ65B, RQ68B, RQ612B	—
Extension cable		RC06B, RC12B, RC30B, RC50B	—
Power supply module		R61P, R63P	—
CPU module	Programmable controller CPU	R04CPU, R08CPU, R16CPU, R32CPU, R120CPU	—
	Motion CPU	R16MTCPU, R32MTCPU	—
I/O module	AC input module	RX10	—
	DC input module	RX40C7, RX41C4, RX42C4	—
	Contact output module	RY10R2	—
	Transistor output module	RY40NT5P, RY41NT2P, RY42NT2P, RY40PT5P, RY41PT1P, RY42PT1P	—
	I/O combined module	RH42C4NT2P	—
Intelligent function module	Analog-digital converter module	R60AD4, R60AD8-G, R60AD16-G, R60ADI8, R60ADV8	—
	Digital-analog converter module	R60DA4, R60DA8-G, R60DA16-G, R60DAI8, R60DAV8	—
	Simple Motion module	RD77MS2, RD77MS4, RD77MS8, RD77MS16	—
	High-speed counter module	RD62P2, RD62D2, RD62P2E	—
	Positioning module	RD75P2, RD75P4, RD75D2, RD75D4	—
	CC-Link IE Field Network module	RJ71GF11-T2	—
	CC-Link IE Controller Network module	RJ71GP21-SX	—
	CC-Link module	RJ61BT11	—
	CC-Link IE built-in Ethernet interface module	RJ71EN71	—
	Serial communication module	RJ71C24, RJ71C24-R2, RJ71C24-R4	—
	Channel isolated RTD input module	R60RD8-G	—
	Channel isolated thermocouple input module	R60TD8-G	—
	Temperature control module	R64TCTT, R64TCRT, R64TCTTW, R64TCRTW	—
Blank cover		RG60	—

Restrictions

■CC-Link IE Field Network module

- The module cannot be used as a relay station for the data link transmission function or the routing function. To use either of those functions, use a CC-Link IE Field Network master/local module controlled by a programmable controller CPU as a relay station.
- An interrupt sequence program cannot be started.
- It cannot be used as a submaster station.
- The dynamic routing function cannot be used.
- The IP packet transfer function using the Ethernet port of C Controller module are not available.

■CC-Link IE Controller Network module

- The module cannot be used as a relay station for the interlink transmission function and the routing function. To use either of those functions, use a CC-Link IE Controller Network module controlled by a programmable controller CPU as the relay station.
- An interrupt sequence program cannot be started.
- The dynamic routing function cannot be used.
- The IP packet transfer function using the Ethernet port of C Controller module are not available.

■CC-Link module

- An interrupt sequence program cannot be started.
- The automatic CC-Link start function cannot be used.
- The standby master function cannot be used.
- The remote I/O net mode cannot be used.
- The master station duplex function cannot be used.
- The station-based block data assurance function cannot be used.

■Serial communication module

- Only the nonprocedural protocol can be used.

■CC-Link IE built-in Ethernet interface module

- Neither the Ethernet function nor the CC-Link IE Controller Network function can be used.

MELSEC-Q series

The following table lists MELSEC-Q series modules and extension cables that can be used for C Controller module.
To use a MELSEC-Q series module, refer to the following manual.
📖 MELSEC iQ-R Module Configuration Manual

Module		Model	Function version
Base unit	Extension base unit	Q52B, Q55B, Q63B, Q65B, Q68B, Q612B	—
Extension cable		QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	—
Power supply module		Q61P, Q61P-A1, Q61P-A2, Q62P, Q63P, Q64P, Q64PN, Q61P-D	—
I/O module	AC input module	QX10, QX10-TS, QX28	—
	DC input module	QX40, QX40-TS, QX40-S1, QX41, QX41-S1, QX41-S2, QX42, QX42-S1, QX70, QX71, QX72, QX80, QX80-TS, QX81, QX81-S2, QX82, QX82-S1	—
	DC high-speed input module	QX40H, QX70H, QX80H, QX90H	—
	DC/AC input module	QX50	—
	Contact output module	QY10, QY10-TS, QY18A	—
	Triac output module	QY22	—
	Transistor output module	QY40P, QY40P-TS, QY41P, QY42P, QY50, QY68A, QY70, QY71, QY80, QY80-TS, QY81P, QY82P	—
	Transistor high-speed output module	QY41H	—
	I/O combined module	QH42P, QX48Y57, QX41Y41P	—
	Interrupt module	QI60	—

Module		Model	Function version
Intelligent function module	Analog-digital converter module	Q64AD, Q68ADV, Q68ADI	Version B or later
	Channel isolated high resolution analog-digital converter module	Q64AD-GH	—
	Channel isolated high resolution analog-digital converter module (with signal conditioning function)	Q62AD-DGH	—
	Channel isolated analog-digital converter module	Q68AD-G	—
	Channel isolated analog-digital converter module (with signal conditioning function)	Q66AD-DG	—
	High speed analog-digital converter module	Q64ADH	—
	Digital-analog converter module	Q62DAN, Q64DAN, Q68DAVN, Q68DAI, Q68DAIN	—
		Q62DA, Q64DA, Q68DAV, Q68DAI	Version B or later
	Channel isolated digital-analog converter module	Q62DA-FG, Q66DA-G	—
	High speed digital-analog converter module	Q64DAH	—
	Analog input/output module	Q64AD2DA	—
	Load cell input module	Q61LD	—
	Current transformer input module	Q68CT	—
	RTD input module	Q64RD	—
	Channel isolated RTD input module	Q68RD3-G	—
		Q64RD-G	Version B or later
	Thermocouple input module	Q64TD	—
	Channel isolated thermocouple/micro voltage input module	Q64TDV-GH	Version B or later
	Channel isolated thermocouple input module	Q68TD-G-H01, Q68TD-G-H02	—
	Temperature control module	Q64TCTTN, Q64TCRTN, Q64TCTTBWN, Q64TCRTBWN	—
	Loop control module	Q62HLC	—
	High-speed counter module	QD64D2	—
	Multichannel high-speed counter module	QD63P6	—
	4Mpps capable high-speed counter module	QD64D2	—
	Channel isolated pulse input module	QD60P8-G	—
	Multi function counter/timer module	QD65PD2	—
	Positioning module	QD70D4, QD70D8, QD73A1*1	—
		QD70P4, QD70P8	Version B or later
	Positioning module with built-in counter function	QD72P3C3	—
	CC-Link/LT master module	QJ61CL12	Version B or later
	AnyWire DB A20 master module	QJ51AW12D2	—
	AnyWireASLINK master module	QJ51AW12AL	—
	MODBUS/TCP interface module	QJ71MT91	—
	MODBUS interface module	QJ71MB91	—
	FL-net (OPCN-2) interface module	QJ71FL71-T, QJ71FL71-B5, QJ71FL71-F01, QJ71FL71-B5-F01	—
		QJ71FL71, QJ71FL71-B2, QJ71FL71-T-F01, QJ71FL71-B2-F01	Version B or later
	AS-i master module	QJ71AS92	Version B or later
	Energy measuring module	QE81WH, QE84WH, QE81WH4W, QE83WH4W	—
	Insulation monitoring module	QE82LG	—
Blank cover		QG60	—

*1 Use the module with a serial number of which first five digits are "16082" or later.

Restrictions

■FL-net (OPCN-2) interface module

- The word block read/write request messages using the message transmission function cannot be received.
- The auto refresh function cannot be used.

SD memory card (need to purchase separately)

One SD memory card can be inserted in C Controller module.

SD memory cards that can be used

Available Mitsubishi Electric Corporation's SD memory cards are as listed below:

Model	Description
NZ1MEM-2GBSD	SD memory card 2 GB
NZ1MEM-4GBSD	SD memory card 4 GB
NZ1MEM-8GBSD	SD memory card 8 GB
NZ1MEM-16GBSD	SD memory card 16 GB

For commercially available SD memory cards, refer to the following. Before using any commercially available SD memory card, it is advised to check and ensure that the card has no impact on the control of the system.
TECHNICAL BULLETIN No. FA-A-0023

Precautions

- Use the format function of CW Configurator to format a SD memory card.
- If any SD memory card other than the one listed above is used, data in the SD memory card may be corrupted or a system shutdown may occur.
- If C Controller module is powered OFF or reset, or the SD memory card is removed while the card is being accessed, data in the SD memory card may be corrupted. Always power OFF or reset C Controller module, or remove the SD memory card after the access to the card has been stopped.

4 WIRING

This chapter explains the wiring methods to C Controller module.

Point

The bend radius of the cable near the connector or port should be at least four times longer than the cable's outside diameter.

4.1 Ethernet Port

This section explains the specification of usable Ethernet cable and its wiring.

Ethernet cable

The following shows the specifications of the cables that can be used for connection with peripherals by using the Ethernet port (CH1 and CH2). Cables compliant with IEEE802.3 10BASE-T/100BASE-TX/1000BASE-T standards can be used.

Transmission speed	Unshielded twisted pair cable (UTP cable) Shielded twisted pair cable (STP cable)	
	Straight cable	Crossing cable
1000 Mbps	Category 5e or higher	Category 5e
100 Mbps	Category 5 or higher	Category 5 or 5e
10 Mbps	Category 3 or higher	Category 3 to 5e

Point

In a high-speed communication (100 Mbps/1000 Mbps) with 100BASE-TX/1000BASE-T connection, a communication error may occur due to high frequency noise generated from a device other than C Controller module depending on the installation environment. When configuring a network system, take the following measures on C Controller module side to eliminate the influence of high frequency noise.

- Do not install the twisted pair cables together with the main circuit or power lines, or bring them close to each other.
- Make sure to place the twisted pair cable in a duct.
- In the environment where the cable is susceptible to noise, use the shielded twisted pair cable (STP cable).
- In an environment where the system is susceptible to noise, include a retry processing in the user program.
- Change the target device to be connected to C Controller module to the one which communicates at 10 Mbps, and decrease the data transmission rate.

■Connecting procedure

1. Insert the Ethernet cable into the C Controller module connector until it clicks with an attention to the orientation of the connector.
2. Pull the cable slightly and check that it is connected properly.
3. Check the lighting status of the SPEED LED on the port to which the Ethernet cable is connected.

Point

The time required from when the cable is connected to when the SPEED LED turns ON may vary. Normally, the LED turns ON in a few seconds. However, it may take longer because the linking-up processing is repeated due to the conditions of devices on the line. If the SPEED LED does not turn ON, check if the cable has any failure.

■Disconnecting procedure

1. Pull out the Ethernet cable while pinching the retaining clip of the connector.

IP address setting

The IP address setting method is shown below.

■Setting IP address

To use the Ethernet port(s), set the IP address with CW Configurator.

[Module Parameter] ⇨ "Own Node Settings" ⇨ "IP Address"

Point

Do not set the IP address for C Controller module with a user program. The network may be no longer functional properly.

The default value is set to the IP address for C Controller module before shipment and after initialization.

Ethernet port	Default IP address
Ethernet port (CH1)	192.168.3.3
Ethernet port (CH2)	No setting

■Checking method of IP address

The IP address set to C Controller module can be checked with the operation selection mode.

For more details on the operation selection mode, refer to the following section.

☞ Page 48 Switch Operation

Precautions

- Set the same value for the network portion of the IP addresses for the target device to be connected and the Ethernet port.
- Set the different value for the network portion of CH1 and CH2 on the Ethernet port.
- A message to the target device (including response packets such as ping) is sent (responded) from the Ethernet port that has IP address of which network portion is the same.

Considerations for connection

Considerations for connection to Ethernet device are shown below.

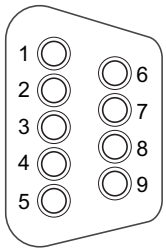
- When the C Controller module has been replaced and also IP address has been changed, then reset the Ethernet device too. If the Ethernet device holds the Ethernet address (MAC address) of the communication target, continuous communication may not be performed since the module replacement and IP address change will change the Ethernet address (MAC address).
- Perform the troubleshooting in accordance with the manual for the Ethernet device when an error occurred on the Ethernet device.
- When Telnet or Shell of CW Workbench is connected to C Controller module, an event/error message may be displayed once VxWorks detects a network error. For details on the displayed event/message, refer to the manual for VxWorks. Please ask Wind River Systems, Inc. for any event/message which cannot be handled.

4.2 RS-232 Interface

This section explains the specification of RS-232 interface and its wiring.

RS-232 connector

The RS-232 interface specifications to connect to a target device are shown below.

Connector shape	Pin No.	Signal code	Signal name	Signal direction (R12CCPU-V ⇔ RS-232 device)
	1	CD(DCD)	Data carrier detect	←
	2	RD(RXD)	Received data	←
	3	SD(TXD)	Transmitted data	→
	4	ER(DTR)	Data terminal ready	→
	5	SG	Signal ground	↔
	6	DR(DSR)	Data set ready	←
	7	RS(RTS)	Request to send	→
	8	CS(CTS)	Clear to send	←
	9	CI(RI)	Ring indicator	←

Use the following product as a connection cable connector.

Connector type	Manufacturer name	Model name
D-sub connector (Solder-connection type)	DDK Ltd.	17JE-13090-02(D8C)(-CG)

The specifications of fixing screws are as follows:

- Connector mating screw: #4-40UNC
- Tightening torque range : 0.15 to 0.20 N·m

Point

- Make sure that RS-232 connection cable shield is single-point grounded.
- Do not short-circuit the FG and SG signals of the RS-232 connection cable. When the FG and SG signals are connected inside of the peripheral device, do not connect the FG signal to C Controller module.
- For connection method of peripheral device, check the specifications of the peripheral device.

Considerations for connection

- A reception error may occur on the target device connected to C Controller module when the power supply for C Controller module or the target device is turned ON or OFF.
- A reception error occurs on the target device when the system on the target device side is booting while C Controller module is transmitting data to the target device.
- When an error occurred on the target device, take the corrective actions in accordance with the manual for the target device.

4.3 USB Connector

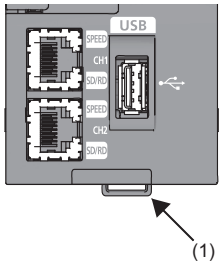
This section explains the specification of usable USB cable and its wiring.

USB cable

Use a USB cable supplied with the USB Mass Storage Class-compliant device.
The type of cable connector connectable with the USB connector is type A.

Preventing USB cable from falling out

Connected cable can be fixed to the hole for fixing band (1) of the module by using a fixing band (recommended specification: width: 6 to 9 mm, thickness: 1 mm or less).



4.4 HMI (GOT)

This section explains the connection method of GOT to C Controller module.

Connection route

C Controller module can be connected to GOT by following route.

- Connection using Ethernet port
- Connection via Network module

Connection using Ethernet port

Connect to GOT by using the Ethernet port (CH1 and CH2).

Connection via Network module

Connection to GOT is available via following Network modules.

- CC-Link IE Controller Network connection
- CC-Link IE Field Network connection
- CC-Link connection (Via intelligent device station, G4)

For connection method via network, refer to the manual for Network module to be used.

5 FUNCTION LIST

This chapter describes the functions of C Controller module.

Function		Description
Program monitoring function (WDT)		Monitors and detects hardware and user program errors using the watchdog timer, which is the internal timer of C Controller module.
Clock function		Manages the time for the functions performed by the system such as date for the event history function.
Remote operation function		Changes the operating status of C Controller module with CW Configurator or user program, or by an external device using SLMP.
I/O module, Intelligent function module access function		Controls the I/O module and Intelligent function module(s), which are controlled by C Controller module, by creating a user program using C Controller module dedicated functions and MELSEC data link functions.
Interrupt function from module		Performs an interrupt routine by an interrupt request from input module, Intelligent function module, or interrupt module.
Fixed cycle processing function		Performs refresh with a module such as Network module and performs data communication with an external device.
Inter-module synchronization function		Performs synchronous control among each module.
Output mode setting of STOP to RUN		Sets the output (Y) mode when the operating status of C Controller module is switched from STOP to RUN.
Memory card function	Boot operation	Transfers files stored in SD memory card to the CPU built-in memory when powering OFF → ON or resetting C Controller module.
	Enable/disable the use of file/data on memory card	Sets whether to use files/data stored on a memory card or not.
RAS function	Self-diagnostic function	Diagnoses any abnormality by C Controller module itself.
	Error clear function	Clears a continuation error occurred in batch.
	Event history function	Collects and saves the operation and error information of each module. The saved event history can be viewed in chronological order.
Security function		Prevents from data pilferage, manipulation, misoperation, illegal execution due to an illegal access to the program assets saved in a personal computer or modules.
Access function using network module	Cyclic transmission	Performs data communication periodically between stations on a network using link devices.
	Transient transmission	Performs data communication with other station when the communication request is issued. Communication with different network can also be performed.
	Access function of each network module	Transmits data to the devices on the network via a Network module controlled by C Controller module.
Ethernet communication function	Connection with MELSOFT product or GOT	Monitors or tests C Controller module via Ethernet.
	Communication with SLMP	Reads/writes device data from/to a personal computer or HMI using SLMP.
	File transfer function (FTP server)	Handles the files in C Controller module from a target device with the FTP client function.
	Time setting function	Configures the time setting on C Controller module by collecting time information with the specified timing from the time information server (SNTP server) connected to LAN.
	Telnet function	Performs remote debugging of C Controller module with Telnet tool on a personal computer.
	Security function	Applies the optimal security according to the network environment by restricting the access to C Controller module for each communication route.
Multiple CPU system function	Out-of-group I/O fetch	Accesses a module not controlled by CPU module to import the input/output (X/Y) or access the buffer memory of Intelligent function module.
	Operation setting	Configures operation settings for the multiple CPU system function.
	Data communication between CPU modules	Performs data communication among CPU modules of a multiple CPU system.
	Interrupt from other CPU	Restarts the user program that is waiting for an interrupt event.
	Issuing an interrupt to other CPU	Issues an interrupt to other CPU from the user program of C Controller module.

MEMO

6 MODULE STARTUP PROCEDURE

This chapter explains the startup procedure and program execution of C Controller module. Perform the hardware diagnostics when the C Controller module is used for the very first time.

Performing hardware diagnostics

1. Mount C Controller module.

Mount Power supply module and C Controller module on Base unit. (MELSEC iQ-R Module Configuration Manual)

2. Power ON the system.

Confirm the wiring and the supply voltage of the power supply before the system is powered ON.

3. Initialize C controller module.

Initialize C Controller module. (Page 39 Initialization)

4. Perform hardware diagnostics.

Check the hardware status of C Controller module. (Page 41 Performing Hardware Diagnostics)

Starting C Controller system

1. Insert SD memory card.

Insert an SD memory card to C Controller module as necessary. (Page 46 Inserting and Removing SD Memory Card)

2. Mount modules and wire for each device.

Mount respective modules on Base unit, and wire for each device. (MELSEC iQ-R Module Configuration Manual)

3. Power ON the system.

Check the following, and turn ON the power supply.

- The wiring and supply voltage of the power supply are in the required range.
- C Controller module is placed into the STOP state.

4. Create a project.

Create a project for C Controller module to be used with a personal computer on which CW Configurator has been installed. (Page 51 Creating Project)

5. Connecting a personal computer to C Controller module

Connect the personal computer on which CW Configurator has been installed to C Controller module. (Page 51 Connecting to Personal Computer)

6. Set parameters.

Set the system parameter, CPU parameter, and module parameter. (Page 52 Setting Parameters)

When using the SD memory card function, or when mounting Intelligent function module, also set parameters other than the above. (User's manual (Application) for each module)

7. Write parameters to C Controller module.

Write the parameters set with CW Configurator to C Controller module. (Page 54 Writing Parameters to C Controller module)

8. Reset C Controller system.

Reset the system by one of the following methods.

- Turning ON → OFF the power supply
- Resetting C Controller module (Page 48 Switch Operation)

9. Check errors.

Check the READY LED and ERROR LED on C Controller module. When any error occurred, perform the troubleshooting. In case of any errors caused by factors other than C Controller module, refer to the manual for respective modules.

10. Create user programs.

Create a user program.

- Create a user program and debug it. (☞ Page 55 Creating User Program)
- Create a script file. (☞ Page 59 Creating Script File)
- Register the user program and the script file in C Controller module. (☞ Page 61 Registering User Program)

11. Reset C Controller system.

Reset the system by one of the following methods.

- Turning ON → OFF the power supply
- Resetting C Controller module (☞ Page 48 Switch Operation)

12. Execute the program.

Change the operating status of the C Controller module to RUN state, and confirm the BUS RUN LED turns ON. (☞ Page 48 Switch Operation)

6.1 Initialization

Initialize C Controller module in the following cases.

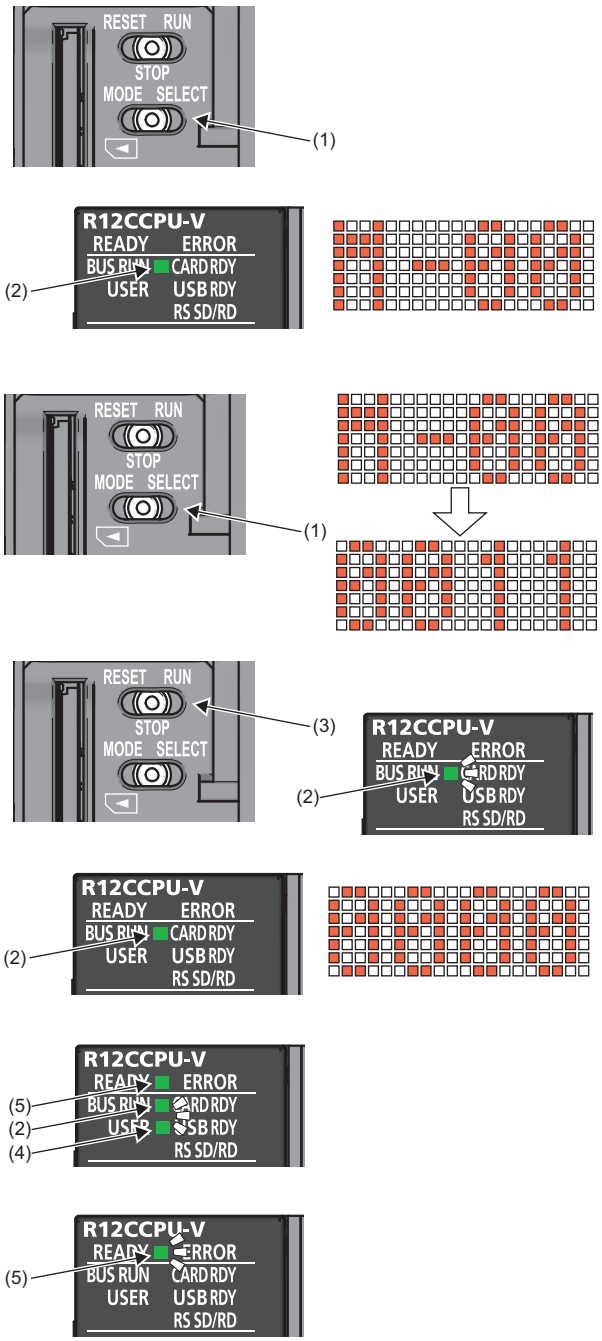
- At the time of the first operation
- C Controller module does not start by execution of the script file registered in the program memory.
- The user name/password set to C Controller module has been forgotten.

Point

The data in the program memory, device/label memory, and data memory is deleted during the process of initialization. Back up all necessary data in advance.

Procedure for initialization

Confirm that the RESET/STOP/RUN switch is positioned at the center i.e. on the "Stop" position at first.



1. Put and hold the MODE/SELECT switch (1) on the MODE position.
2. Power ON C Controller module. The BUS RUN LED (2) turns ON, and "M-00" is displayed on the dot matrix LED.
3. Release the MODE/SELECT switch (1) and put it back to the center position.
4. Set the MODE/SELECT switch (1) to the SELECT position. Every time the switch is set to the SELECT position, the value of mode displayed on the dot matrix LED is changed. Repeat this switch movement until "0011" is displayed on the dot matrix LED.
5. Set the RESET/STOP/RUN switch (3) to the RUN position. The selected mode is executed. The BUS RUN LED (2) will be flashing during initialization.
6. Confirm that the BUS RUN LED (2) turns ON and "0000" is displayed on the dot matrix LED, and reset C Controller module.
7. The initialization is performed by resetting the module. The READY LED (5) will turn ON, and the BUS RUN LED (2) and USER LED (4) will be flashing during the initialization.
8. Upon normal completion of the initialization, the BUS RUN LED (2) and USER LED (4) turns OFF, and the READY LED (5) starts flashing.
9. Reset C Controller module.

■Mode selection

Mode	Dot matrix LED display	Description
10	0010	Default IP setting
11	0011	Module initialization setting

■Abnormal completion of initialization process

Upon abnormal completion of the initialization, the ERROR LED will be flashing, and the READY LED and USER LED turn ON. In the case of abnormal completion, perform the initialization again.

Point

Do not reset the module during the initialization of C Controller module. Perform the initialization again if the module has been reset in error.

Module status after initialization

After initialization, the status of C Controller module will be as follows:

■Default IP setting

- The registered script file stops to be executed.*1
- The IP address for C Controller module is set to the default. (☞ Page 31 Ethernet Port)

*1 The script file name is renamed as "STARTUP.BAK", and deregistered.

■Module initialization setting

- Default parameters are set to the data memory.
- The program memory, device/label memory, and data memory are formatted.
- The security password is initialized. (Default password: password)

6.2 Performing Hardware Diagnostics

Diagnose the hardware of C Controller module.

Hardware diagnostics timing

The hardware diagnostics is used in the following cases.

- At the time of first operation
- For troubleshooting

Point

Do not power OFF or reset C Controller module during the hardware diagnostics. Doing so may cause abnormal startup of C Controller module. If it does not start normally, perform the initialization.

Diagnostics types

The mode of hardware diagnostics is shown below.

Mode	Dot matrix LED display	Diagnostic item	Description
0	M-00	Diagnostic test for Mode 1 to Mode 6	Performs the diagnostic test in the order from Mode 1 to Mode 6.
1	M-01	Program memory, data memory diagnostic test	Reads data in the program memory and data memory, and performs error detection.
		Device/label memory diagnostic test	Writes/reads test data to/from the device/label memory, and checks by verifying the data.
2	M-02	Ethernet diagnostic test	Diagnoses the Ethernet port (CH1 and CH2) status.
3	M-03	SD memory card interface diagnostic test	Diagnoses the SD memory card slot status.
4	M-04	RS-232 diagnostic test	Conducts a self-loopback test of the RS-232 connector. The wiring for self-loopback is required.
5	M-05	USB diagnostic test	Diagnoses the USB connector status.
6	M-06	Bus diagnostic test	Writes/reads/verifies the memory of the internal bus and register.
7	M-07	Dot matrix LED test	Shows the dot matrix LED test display.

Performing diagnostics

The following shows the procedure for hardware diagnostics.

Preparation

Perform the following before the hardware diagnostics.

1. Mount the modules.

Mount Power supply module and C Controller module on Base unit.

Point

The hardware diagnostics can be performed even when C Controller module is not mounted on the CPU slot. To perform the hardware diagnostics with the module mounted on the slot other than the CPU slot, mount other CPU module on the CPU slot. Although an error may be detected on the mounted CPU module, the hardware diagnostics can be performed.

2. Check the wiring.

- Check that the power supply cable is wired properly.
- Do not connect any cable other than power supply cable.

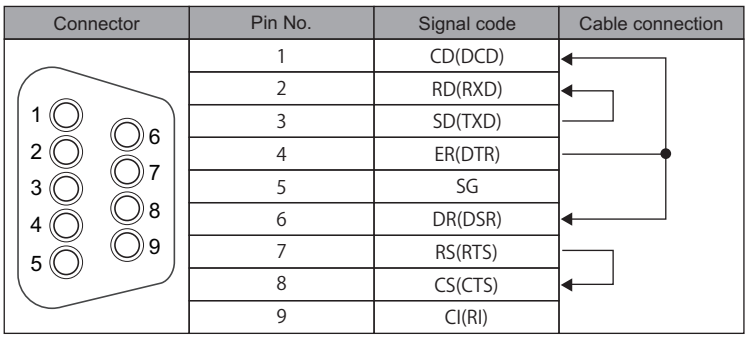
3. Make the necessary preparations for respective diagnostics.

4. Power ON.

- Check that the power supply voltage is within the range of the specifications.
- Confirm that the RESET/STOP/RUN switch is put on the STOP position.

Preparation required for each diagnostics

Perform the following before starting each mode (0 to 7) of hardware diagnostics.

Mode	Description
0	Make all of the preparations required for Mode 1 to 6.
1	Back up the data in the program memory, data memory, and device/label memory.
2	Check that no cable is connected to the Ethernet port.
3	Check that no SD memory card is inserted.
4	Connect a cable to the RS-232 connector. The connector pin arrangement and cable connection are shown below. 
5	Check that no cable is connected to the USB connector.
6	No preparation required for this mode.

Mode selection

The following explains the procedure to select mode.

1. Set the RESET/STOP/RUN switch to the RESET position, and keep it up to the step 4.
2. Check that all LEDs turned OFF.
3. Set the MODE/SELECT switch to the MODE position, and keep it up to the step 6.
4. Put the RESET/STOP/RUN switch back into the STOP position.
5. The BUS RUN LED turns ON, and "M-00" is displayed on the dot matrix LED.
6. Put the MODE/SELECT switch back to the center position.
7. Set the MODE/SELECT switch to the SELECT position, and select the desired diagnostic mode.

Every time the switch is set to the SELECT position, the value of mode displayed on the dot matrix LED is changed.
Repeat this switch movement until the dot matrix LED displays the desired diagnostic mode.

Mode execution

The following shows how to execute the selected mode.

■Executing Mode 0 to 6

1. Set the RESET/STOP/RUN switch to the RUN position.

- While Mode 0 or 1 is being executed, the BUS RUN LED will be flashing, and the current mode and its progress are displayed alternatively on the dot matrix LED.

(Example): "M-01" (diagnostic mode) ← displaying alternatively → "0050" (progress: %)

- While Mode 2 to 6 is being executed, the BUS RUN LED will be flashing, and the current mode is displayed on the dot matrix LED.

2. Check that the BUS RUN LED turns ON.

When the test is completed normally, "0000" is displayed on the dot matrix LED.

3. Turn the power supply OFF.

Point

Before performing the steps of mode execution, put the RESET/STOP/RUN switch back to the STOP position, if the switch is in the RUN position.

■Executing Mode 7

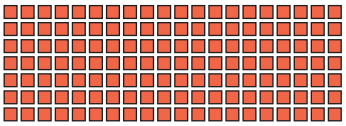
1. Set the RESET/STOP/RUN switch to the RUN position.

2. Set the MODE/SELECT switch to the SELECT position.

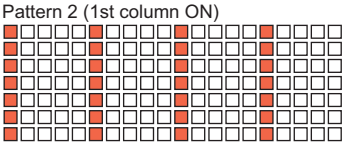
Every time the switch is set to the SELECT position, the lighting status on the dot matrix LED switches.

ON OFF

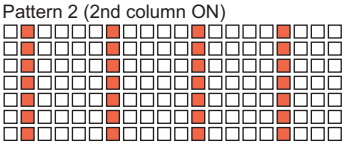
Pattern 1 (All LEDs ON)



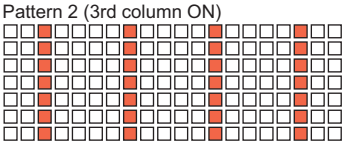
Pattern 2 (1st column ON)



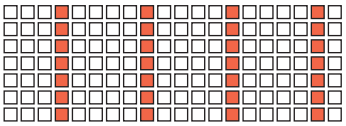
Pattern 2 (2nd column ON)



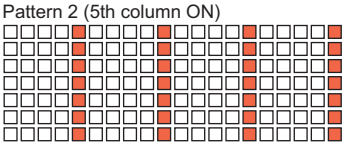
Pattern 2 (3rd column ON)



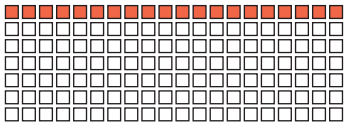
Pattern 2 (4th column ON)



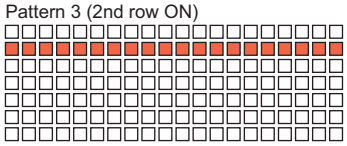
Pattern 2 (5th column ON)



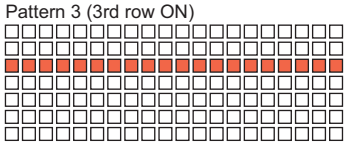
Pattern 3 (1st row ON)



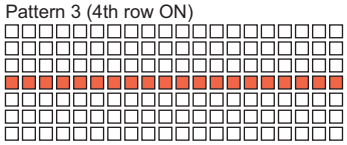
Pattern 3 (2nd row ON)



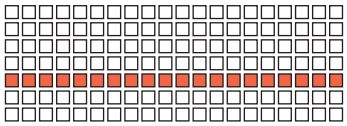
Pattern 3 (3rd row ON)



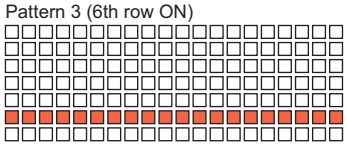
Pattern 3 (4th row ON)



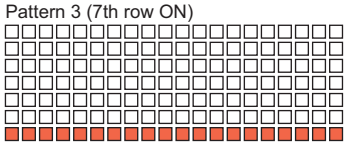
Pattern 3 (5th row ON)



Pattern 3 (6th row ON)



Pattern 3 (7th row ON)



3. Turn the power supply OFF.

Point

Visually inspect the dot matrix LED and confirm no inactive dot exists on the LED. If there is any inactive LED, C Controller module may have its hardware failure. Please consult your local Mitsubishi representative.

Operation at error detection

The error contents displayed at the time of error detection are shown below.

Dot matrix LED displays other than "0000"

The ERROR LED start flashing and the value corresponding to the diagnostics on which an error occurred will be displayed at the time of error detection during diagnostics or setting. Only flashing of the ERROR LED without dot matrix LED display means a system error.

Mode	Dot matrix LED display	Diagnostics on which an error occurred
1	E010	Program memory, data memory diagnostic test Device/label memory diagnostic test
	E020	
	E030	
	E040	
2	E050	Ethernet diagnostic test (CH1)
	E060	Ethernet diagnostic test (CH2)
3	E070	SD memory card interface diagnostic test
4	E080	RS-232 diagnostic test*1
5	E090	USB diagnostic test
6	E0A0	Bus diagnostic test
	E0B0	
	E0C0	
	E0D0	
	E0E0	

*1 An error may occur if a wiring cable is not connected properly. Connect the cable or wire the cable correctly again, and perform the diagnostics for Mode 4.

Point

The diagnostics or setting will be terminated at the time of abnormal completion. Retry the diagnostics or setting. If an error is detected after the abnormal completion, C Controller module may have its hardware failure. Please consult your local Mitsubishi representative.

6.3 Inserting and Removing SD Memory Card

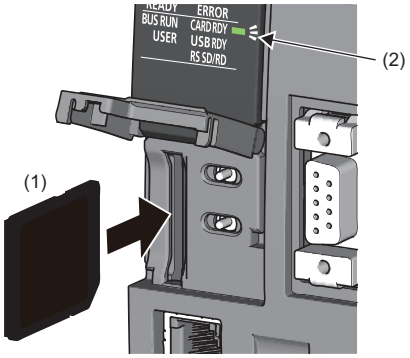
This section explains the method for inserting/removing an SD memory card.

Point

- Follow the procedures shown below to insert or remove an SD memory card while the power is ON. Failure to do so may cause data corruption in the SD memory card.
- Change the MODE/SELECT switch operation to "SD UNMOUNT" or "SD/USB UNMOUNT" before removing the SD memory card. (☞ Page 48 Switch Operation)

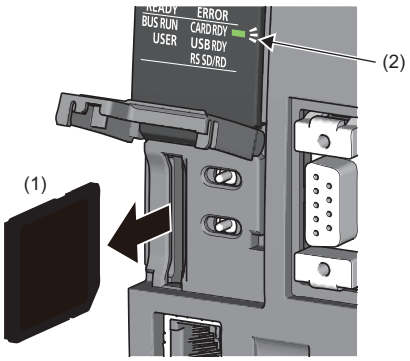
How to insert a card

Insert an SD memory card according to the following procedure with attention to its direction.



1. Insert an SD memory card (1) straight into the SD memory card slot with its cutout pointed down. Make sure it is not uplifted after inserting it.
2. The CARD RDY LED (2) keeps flashing until the SD memory card is ready to be used.
3. Once the CARD RDY LED (2) turns ON, the card can be used.

How to remove a card



1. Check that no SD memory card is accessed.
2. Hold the MODE/SELECT switch in the SELECT position to unmount the SD memory card. The CARD RDY LED (2) is flashing, which indicates that process of unmounting SD card is in progress, and later upon successful completion, the LED turns OFF.
3. Push the SD memory card (1) in once, and pull it out straight.

Point

The SD memory card can also be mounted or unmounted with a user program using C Controller module dedicated functions (CCPU_MountMemoryCard, CCPU_UnmountMemoryCard).

Precautions

Do not perform the following operations while accessing the files in an SD memory card. Doing so may result in data corruption in the SD memory card or file system error.

- Resetting C Controller module
- Powering ON → OFF the system
- Unmounting the SD memory card
- Removing the SD memory card

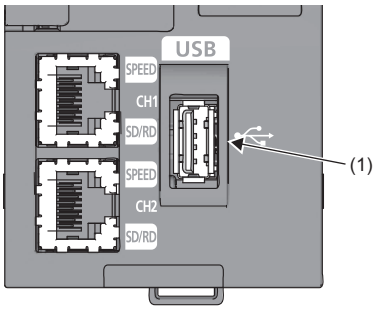
6.4 Connecting and disconnecting USB Mass Storage Class-compliant Device

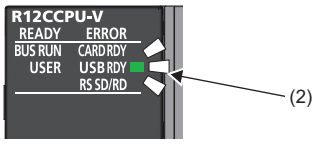
This section explains the method for connecting/disconnecting a USB Mass Storage Class-compliant device.

Point

- Follow the procedures shown below to connect or disconnect a USB Mass Storage Class-compliant device while the power is ON. Failure to do so may cause data corruption in the USB Mass Storage Class-compliant device.
- Change the MODE/SELECT switch operation to "USB UNMOUNT" or "SD/USB UNMOUNT" before disconnecting the USB Mass Storage Class-compliant device. (☞ Page 48 Switch Operation)

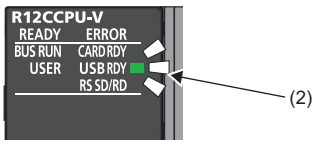
How to connect a USB device





1. Connect a connector of USB Mass Storage Class-compliant device or USB cable to the USB connector (1). Firmly insert the connector to prevent it from falling out.
2. The USB RDY LED (2) keeps flashing until the USB Mass Storage Class-compliant device is ready to be used.
3. Once the USB RDY LED (2) turns ON, the USB Mass Storage Class-compliant device can be used.

How to disconnect a USB device



1. Check that no USB Mass Storage Class-compliant device is accessed.
2. Hold the MODE/SELECT switch in the SELECT position to unmount the USB Mass Storage Class-compliant device. The USB RDY LED (2) is flashing, which indicates that process of unmounting USB Mass Storage Class-compliant device is in progress, and later upon successful completion, the LED turns OFF.
3. Disconnect the USB Mass Storage Class-compliant device or USB cable that is inserted to the USB connector.

Point

The USB Mass Storage Class-compliant device can also be unmounted with a user program using C Controller module dedicated functions (CCPU_UnmountMemoryCard).

Precautions

Do not perform the following operations while accessing the files in a USB Mass Storage Class-compliant device. Doing so may result in data corruption in the USB Mass Storage Class-compliant device or file system error.

- Resetting C Controller module
- Powering ON → OFF the system
- Unmounting the USB Mass Storage Class-compliant device
- Disconnecting the USB Mass Storage Class-compliant device

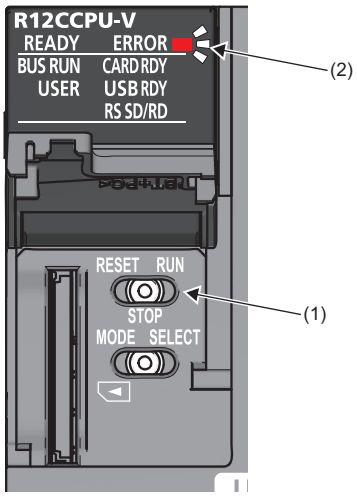
6.5 Switch Operation

This section explains the method for changing the operating status of C Controller module.

RESET/STOP/RUN switch

The operating status of C Controller module can be changed using the RESET/STOP/RUN switch.

- By setting the switch to the RUN position, the operating status is changed to RUN. (Status where output (Y) from a user program and writing to the buffer memory are permitted)
- By setting the switch to the STOP position, the operating status is changed to STOP. (Status where output (Y) from a user program and writing to the buffer memory are prohibited)
- Operating the switch with the following procedure resets C Controller module.



1. Hold the RESET/STOP/RUN switch (1) in the RESET position.
2. Check that all LEDs turn OFF after the ERROR LED (2) flashes several times.
3. Put the RESET/STOP/RUN switch (1) back to the STOP position.

Point

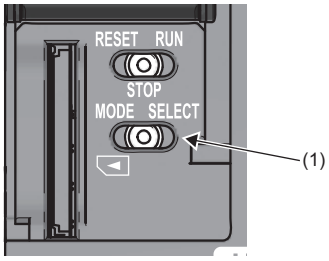
Operate the RESET/STOP/RUN switch by fingertip. Using tools such as a screwdriver may cause damage on the switch.

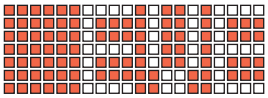
MODE/SELECT switch operation

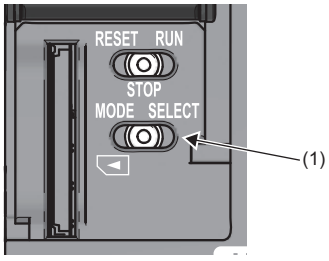
With the MODE/SELECT switch, the mode can be switched between the operation selection mode and normal operation mode, and the operation selected in the operation selection mode can be performed.
The 'notification/unmount' and 'information display on the dot matrix LED' can be performed in the operation selection mode.
Make sure C Controller module is in normal operation before selecting its operation.

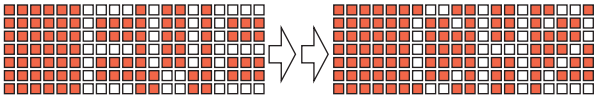
Selecting and performing an operation

The following shows how to select and perform the operation.









1. Hold the MODE/SELECT switch (1) in the MODE position.
2. The selectable operation is displayed on the dot matrix LED. (In the operation selection mode, the lighting status of LED display is reversed.)
3. Put the MODE/SELECT switch (1) back to the center.
4. Set the MODE/SELECT switch (1) to the SELECT position. Every time the switch is set to the SELECT position, the value of mode displayed on the dot matrix LED is changed. Repeat this switch movement until the desired operation is displayed on the dot matrix LED.
5. Hold the MODE/SELECT switch (1) in the SELECT position.
6. The selected operation is performed.

Point

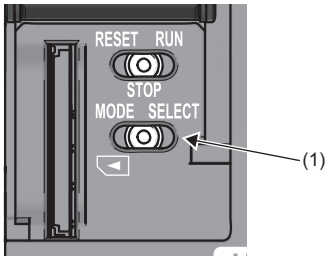
The mode is switched to the normal operation mode by holding the MODE/SELECT switch in the MODE position while selecting an operation.

LED display*1	Operation	Operation at execution
EVENT	Notifies an event to the user program. (Default)	Notification/unmount*2
SD UNMOUNT	Unmounts the SD memory card forcibly.	
USB UNMOUNT	Unmounts the USB Mass Storage Class-compliant device forcibly.	
SD/USB UNMOUNT	Unmounts the SD memory card and USB Mass Storage Class-compliant device forcibly.	
USER*3	Displays contents specified by the user on the dot matrix LED. (Default)	Information display on the dot matrix LED
ERROR*4	Displays an error code on the dot matrix LED.	
CH1*5	Displays IP address of the Ethernet port (CH1) on the dot matrix LED.	
CH2*5	Displays IP address of the Ethernet port (CH2) on the dot matrix LED.	

*1 The LED display scrolls horizontally (right → left) to display the portion not appeared on dot matrix LED.
*2 The selected operation is registered in the behavior caused when holding the switch in the SELECT position, and can be performed even in the normal operation mode.
*3 The character string output with the C Controller module dedicated function (CCPU_SetDotMatrixLED) is displayed. In addition, when this operation is selected again after switched to other operation, the previously shown character string will be displayed.
*4 The latest error is displayed. ("—" is displayed when no error occurred.)
*5 When the IP address is not set, "—.—.—.—" is displayed.

■Performing the 'notification/unmount' in the normal operation mode

The last selected operation (out of 'notification/unmount') in the operation selection mode is registered as the operation performable by holding the switch in the SELECT position. By holding the MODE/SELECT switch in the SELECT position, the registered operation can be performed even in the normal operation mode.



1. Hold the MODE/SELECT switch (1) in the SELECT position.
2. The operation selected in the operation selection mode is performed.

Point

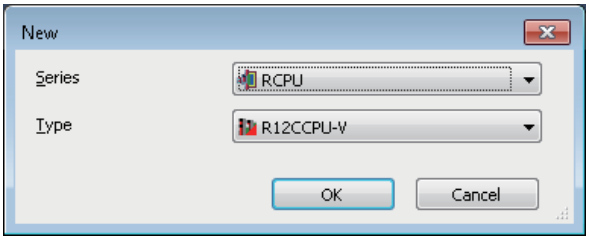
- By setting the MODE/SELECT switch to the SELECT position once during the normal operation, the operation that is currently selected is displayed on the dot matrix LED display.
- Even while performing the operation among the 'information display on the dot matrix LED', the operation among the 'notification/unmount' can also be performed.

6.6 Creating Project

Create a project by starting CW Configurator.

[Project] ⇨ [New]

Creation procedure

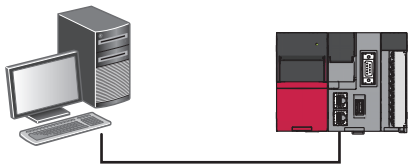


1. Select the C Controller module to be used in "Type", and click the [OK] button.

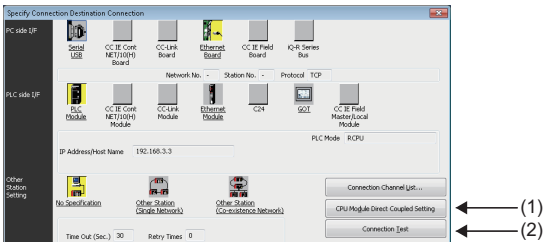
6.7 Connecting to Personal Computer

This section explains the procedure to have direct connection between a personal computer and C Controller module.

Connection procedure



1. Connect a personal computer with C Controller module with an Ethernet cable.



2. Select [Online] ⇨ [Specify Connection Destination] from the menu of CW Configurator.
3. On the "Specify Connection Destination" screen, click the [CPU Module Direct Coupled Setting] button (1).
4. Select the connection method to C Controller module, and click the [Yes] button.
5. Click the [Communication Test] button (2) on the "Specify Connection Destination" screen to check the connection to C Controller module is available.

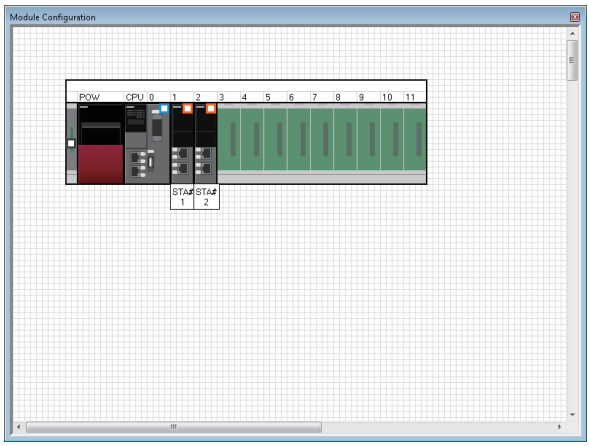
6.8 Setting Parameters

Set parameters for the system and for respective modules.

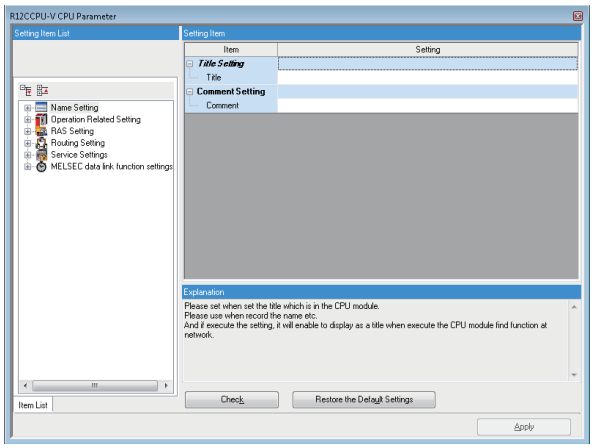
CW Configurator is connected to the actual system configuration

Read the actual system configuration to the Module Configuration Diagram of CW Configurator to set parameters.

"Navigation window" ⇨ "Module Configuration"



1. Open the Module Configuration Diagram, and select [Online] ⇨ [Read Module Configuration from PLC].
2. The system parameter has been set automatically, and the actual system configuration is displayed on the Module Configuration Diagram.



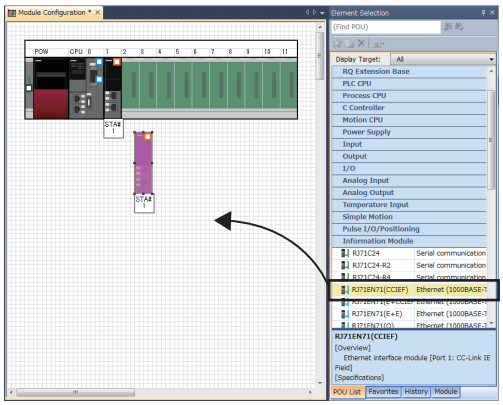
3. Double click the CPU module, I/O module, and Intelligent function module shown to display the parameter editor for the respective modules.
4. After setting the parameters, click the [Apply] button to close the parameter editor.

Precautions

RQ extension base unit, MELSEC-Q series extension base unit, or modules mounted on these extension base units cannot be read. For the modules unable to be read, create the module configuration by dragging each module from the Element Selection window and dropping it on the Module Configuration Diagram.

CW Configurator is not connected to the actual system configuration

Create the module configuration manually to set parameters.



1. Select a Base unit to be used from the Element Selection window, and drag and drop it on the Module Configuration Diagram.
2. Drag respective modules to be used and drop it on the Base unit placed in the diagram.
3. Select [Edit] ⇨ [Parameter] ⇨ [Fix] from the menu.
4. Double click the module to display the parameter editor for the respective modules.
5. After setting the parameters, click the [Apply] button to close the parameter editor.

Parameter settings from the navigation window

Set the following parameters from the navigation window.

■System parameter

To change the number of slots of Base unit or the number of occupied points for a module as well as to configure the multiple CPU setting or synchronization setting, the system parameter is set from the navigation window.

"Navigation window" ⇨ "Parameter" ⇨ "System Parameter"

■Module parameter of CPU module

To use a built-in Ethernet function for CPU module, setting the module parameter for CPU module is required.

"Navigation window" ⇨ "Parameter" ⇨ (CPU module) ⇨ "Module Parameter"

■Memory card parameter

To use any of the functions with SD memory card, setting the memory card parameter is required.

"Navigation window" ⇨ "Parameter" ⇨ (CPU module) ⇨ "Memory Card Parameter"

■Multiple module parameters and module extended parameter

Some of Intelligent function module may require parameter settings for multiple modules or module extended parameter setting.

"Navigation window" ⇨ "Parameter" ⇨ "Module Information" ⇨ (each of Intelligent function module) ⇨ "Module Extended Parameter" or "Module Parameter"

Point

Settings with the module configuration diagram and settings by system parameter are used properly as follows depending on their usage.

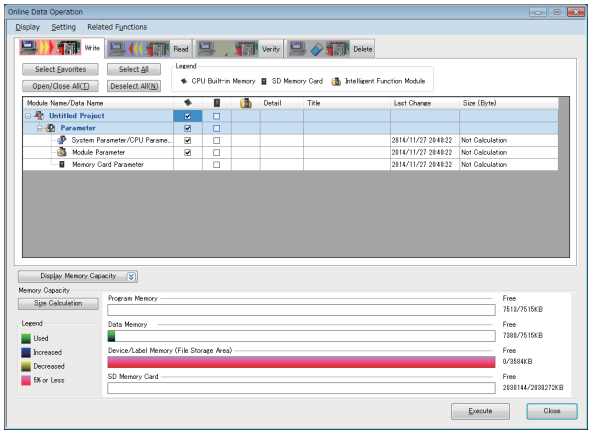
- Module configuration diagram: Module-specific information such as the number of occupied points is used without changing.
- System parameter: The number of slots of Base unit or the number of occupied points for a module is changed.

6.9 Writing Parameters to C Controller module

Write parameters to C Controller module.

[Online] ⇨ [Write to PLC]

Operating procedure



1. Select system parameter, CPU parameter, and module parameter.
2. Click the [Execute] button.
3. After writing to C Controller module is completed, click the [Close] button.

Point

The system parameter and CPU parameter are related to the operation of C Controller module. The module parameter and module extended parameter are related to the use and operation of I/O module or Intelligent function module.

6.10 Creating User Program

A user program is created by using VxWorks standard API functions and functions implemented on C Controller module in accordance with the specification of VxWorks.
For programming method of VxWorks standard API functions, refer to the manual for VxWorks of the following version.

- VxWorks Version 6.9

For details on the dedicated function library that can be used by C Controller module, refer to the following manual.
MELSEC iQ-R C Controller Module Programming Manual

Point

For details on sample programs, please consult your local Mitsubishi representative.

Programming procedure

The program creation procedure is shown below. For information on project creation and programming method, refer to the following manual.
CW Workbench/CW-Sim Operating Manual

1. Install CW Workbench on a personal computer.
2. Start CW Workbench, and check that VxWorks image file version of the personal computer is the same as that of C Controller module.
3. Create a project.
4. Configure the setting to use the dedicated function library.
5. Program for a user program.
6. Write the created user program and the script file to C Controller module.
7. Debug the user program with CW Workbench.

Considerations for programming

The following describes considerations for programming.

Considerations for creating user program

■Endian format (memory layout)

The endian format (memory layout) of C Controller module is little endian. Compile a user program in the little endian format.

■VxWorks real-time process (RTP)

C Controller module does not support applications running in VxWorks real-time process. Create a user program as an application based on the VxWorks kernel.

■Build property

Add and set "-mlong-calls" to CC_ARCH_SPEC macro of the build property to compile a user program.

Select [Project Explorer] of CW Workbench, and right click the respective project. Select [Properties] ⇨ [Build Properties] ⇨ [Variables] ⇨ "Build spec specific settings" ⇨ "CC_ARCH_SPEC".

■User program execution

Execute a user program by starting a task from the script file. The system may malfunction if the user program is executed without the task being started.

■Maximum number of tasks

The maximum number of tasks that can simultaneously be executed in or as user program(s) using the C Controller module dedicated functions and MELSEC data link functions is 180. If more than 180 tasks are executed simultaneously, the system may not operate properly.

■Startup of a task performing floating-point operations

Always specify the VX_FP_TASK option for the third argument of taskSpawn when activating the following tasks.

- A task performing floating-point operations
- A task calling a function that returns floating-point value
- A task calling a function that takes floating-point value as an argument

Activating the above task without the VX_FP_TASK option specified may cause the operating system runaway.
For more details on the VX_FP_TASK option, refer to the manual for VxWorks. For information on specifying the VX_FP_TASK option in a script file, refer to the following section.
☞ Page 59 Creating Script File

■Task execution in STOP or PAUSE status

Even if the operating status of C Controller module is STOP or PAUSE, the user program task does not stop. Use the C Controller module dedicated function (CCPU_GetCpuStatus) to split the user program processing according to the operating status of C Controller module.

■Priority of tasks to be executed

Set the priority of a task to execute a user program as described below.

- When access is not made with FTP during user program execution, set the priority of the user program task to 100 or more (100 to 255). Operating with the priority set to 0 to 99 may cause improper operation of the system.
- When access is made with FTP during user program execution, the actual FTP processing (task) of C controller module is performed at the priority of 200. Set the priority of the user program task to 201 to 255 to access with FTP during user program execution. Insert a wait processing (such as taskDelay) to the user program to let the actual FTP processing operate when setting the priority of the user program task to 100 to 200.

■Communication with a target device via Ethernet

Check the port number being used in C Controller module in advance using the VxWorks standard "netstat" command to communicate with a target device by Ethernet communication. Do not use any port number that has already been used. Normal communication may not be performed if used.

■Processing when no response is returned from a function

The response from a function may not be returned when an error occurs on C Controller module. Design a user program take into account the possibility of no response from the function. The error occurrence status can be checked using the C Controller module dedicated function (CCPU_GetErrInfo).

■Memory fragmentation

Allocating and deallocating memory frequently may cause improper operation of the system due to memory fragmentation.

■Restrictions on MELSEC data link functions

A path for MELSEC data link functions does not support to be shared among multiple tasks. Make sure to manage a path opening/closing for each task.

■Considerations for using VxWorks standard API functions

- Use the C Controller module dedicated function (CCPU_SysClkRateSet) to change the system clock rate, and do not use the VxWorks function (sysClkRateSet). Doing so results in unstable VxWorks operation.

■Access to USB Mass Storage Class-compliant device

To create a user program accessing a USB Mass Storage Class-compliant device, implement processing to check if accessing to the USB Mass Storage Class-compliant device is allowed and to retry. Although a USB Mass Storage Class-compliant device is automatically mounted when connected, it may take several minutes for the device to be accessible depending on its format type or capacity.

Considerations for interrupt service routine

Fully understand the restrictions on VxWorks, the operating system of C Controller module, in order to create a routine to be executed in an interrupt service routine (ISR). Setting an abnormal value to the argument of a function that is executed from an interrupt service routine, or executing a function other than for interrupt service routine from an interrupt service routine may cause the operating system runaway.

In C Controller module, C Controller module dedicated functions for ISR out of the dedicated function library can be used. For details, refer to the following manual.

MELSEC iQ-R C Controller Module Programming Manual

Point

To execute the other dedicated functions provided by C Controller module with them synchronized with an interrupt, create a user program with notification processing implemented, and process it with the task.

Considerations for CW Workbench connection

■Error occurred during program download

When a user program is specified and downloaded to a target (C Controller module) with CW Workbench, the system failure/stop (such as user watchdog timer error) may occur on C Controller module during the download if the program size is too large. Take either of the following corrective actions in the case of system failure/stop.

- Increase the value of the watchdog timer with CW Configurator.
- Load the program and debug in C Controller module.

■Interrupt processing delay

During remote debugging with CW Workbench, C Controller module may be in the state prohibiting an interrupt, and therefore, any processing called from an interrupt routine (such as C Controller dedicated functions for ISR) is not executed. Interrupts that are expected to occur at the fixed interval including periodic timer interrupt.

■Restarting C Controller module

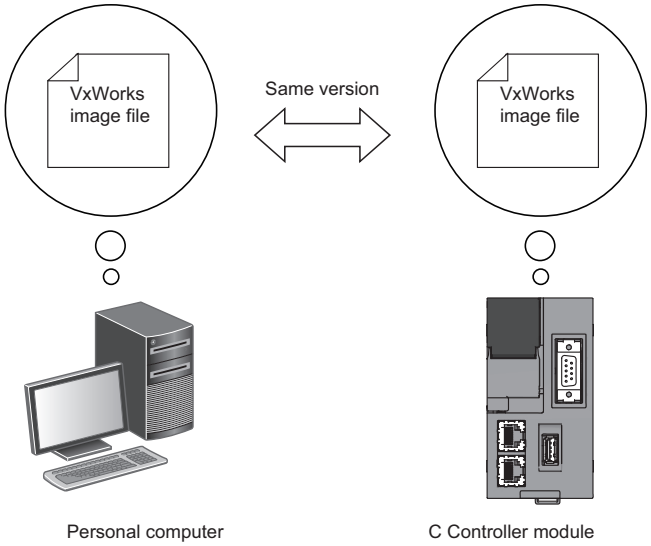
When a connection target C Controller module is restarted with CW Workbench connected, CW Workbench automatically establishes the connection once the C Controller module has been started up. At that time, an error may occur since the system task which has been operating in the C Controller module is temporarily blocked. To restart the connection target C Controller module, ensure that CW Workbench is disconnected.

■Message displayed on Host Shell

Message(s) issued by VxWorks during Host Shell connection may be displayed. For details on messages of VxWorks, refer to the manual for VxWorks or the help of CW Workbench.

6.11 Checking VxWorks Image File

Before debugging the user program, confirm that the VxWorks image file version, which is the same as that of C Controller module, is specified for CW Workbench.
Specifying a different VxWorks image file prevents normal debugging.



Checking method

The checking methods for VxWorks image file are shown below.

■C Controller module side

Check the upper two digits of the product information marking with the diagnostic function of CW Configurator or the rating plate on the side of C Controller module.

■Personal computer side

Check the file name of VxWorks image file specified with CW Workbench.

- R12CCPU-V_XX

XX: Upper 2 digits of product information (16 digits)

VxWorks image files are not identical

Obtain the VxWorks image file from C Controller module.

1. Copy the VxWorks image file stored in the system memory (/SYSTEMROM/OS_IMAGEFILE) of C Controller module to the personal computer by using FTP.

The default setting for FTP is as follows.

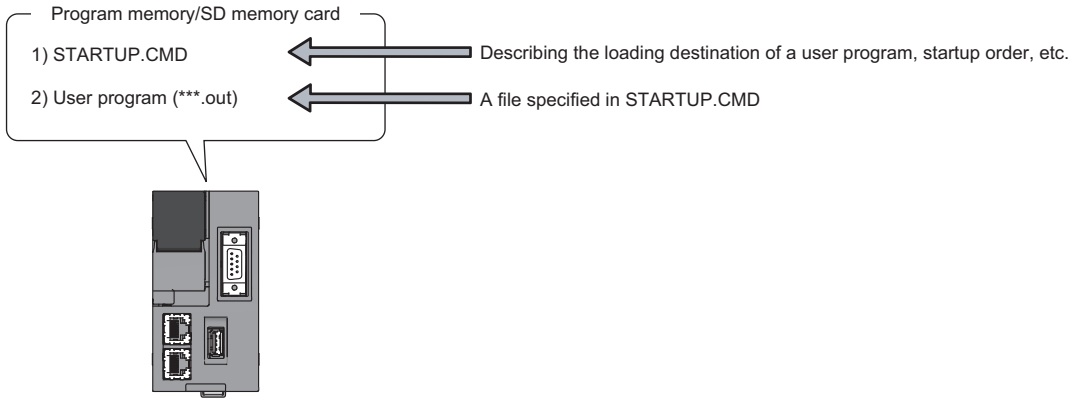
Item	Default
Login name	target
Password	password

2. Configure the target server connection setting with CW Workbench.

6.12 Creating Script File

Script file

A script file, "STARTUP.CMD" is a file that describes the loading destination of a user program which starts at the time of C Controller module startup and the starting order of the tasks.


Program memory/SD memory card
1) STARTUP.CMD
2) User program (***.out)
Describing the loading destination of a user program, startup order, etc.
A file specified in STARTUP.CMD

Considerations for creating a script file

■Starting user program

Describe a command so that a user program is executed by activating the task*1.

*1 Task priority 100 to 255

■Specifying VX_FP_TASK option

When specifying a VX_FP_TASK option for the third argument of taskSpawn in a script file, specify '0x1000000'. For details on the VX_FP_TASK option, refer to the manual for VxWorks.

Starting with the VX_FP_TASK option specified for "funcA" function

```
taskSpawn("taskA",100,0x1000000,20000,funcA,0,0,0,0,0,0,0)
```

Script file storage location

A script file can be stored in the program memory and SD memory card. Store the file in the root directory.

■A script file stored into both the program memory and SD memory card

When a script file is stored in both memories, the script file in the SD memory card has priority, and the script file in the program memory is not executed.

Point

In the system which has been operated by a script file stored in the program memory, its processing can be switched for maintenance easily by installing an SD memory card in which a script file for maintenance work is stored.

Description of script

■Description of command

- Only one command can be described in one line.
- Up to 12 arguments can be specified for one command.

■Description of comment statement

- Describe "//" at the beginning of a line.
- There is no limit on the number of characters in a comment statement.

■Executing C++ functions

Describe the function declaration portion on C++ source code as follows.

- extern "C" {Function declaration portion}

Point

Description in a script file allows the following operations.

- Copy registration of a user program to the program memory
- Formatting the program memory

Commands described in a script file are the same as contents described in a startup script file for VxWorks. For more details, refer to the manual for VxWorks.

Example of script file description

The following shows an example to load a user program in the program memory and SD memory card from a script file in the program memory.

■Storage file

Memory	File storage destination path	File name	Description
Program memory	/0	STARTUP.CMD	Script file to load a user program
	/0/DirA	fileA.out	User program ("funcA" function has been already included.)
SD memory card	/2/DirB	fileB.out	User program ("funcB" function has been already included.)

■Task contents

Activation order	Task name	Priority	Stack size	Function name	Argument specification
1	Default: tN (N=1, 2, ...)	Default: 100	Default: 20000 bytes	funcA	None
2	taskB	120	5000 bytes	funcB	Specified (First argument: 10)

■Example of script file description

- STARTUP.CMD

```
//Load the "fileA.out" file from "DirA" directory in the program memory.
ld(1,0,"/0/DirA/fileA.out")
//Load the "fileB.out" file from "DirB" directory in the SD memory card.
ld(1,0,"/2/DirB/fileB.out")
//Generate the "funcA" function under the default task name (t1). (The "funcA" function is already included in the fileA.out file.)
sp(funcA,0,0,0,0,0,0,0,0,0,0)
//Generate  the "funcB" function under the default task name, "taskB". (The "funcB" function is already included in the fileB.out file.)
taskSpawn("taskB",120,0,5000,funcB,10,0,0,0,0,0)
```

Point

Since the maximum number of arguments can be specified for one command is 12, up to seven arguments will be given to the function entry specified with taskSpawn (example: funcB). The task will not be activated if eight or more arguments are specified for the function entry specified with taskSpawn (example: funcB).

6.13 Registering User Program

This section explains the procedure outline of user program registration.

1. Describe the loading destination of the user program which starts at the time of C Controller module startup using the script file, "STARTUP.CMD".
2. Write the script file and user program file to C Controller module.
3. Reset C Controller module, or turn OFF → ON the power supply.

Point

- User program files can be stored in any memories that can store files.
- To register by overwriting, close the file before overwriting it. Overwriting with the file opened may fail.

File writing method

The following methods are available to write files.

- Write files using the FTP function from a personal computer.
- Write files using copy command in script file from the SD memory card.

The following shows the user program registration procedures by using each method above.

Registering from a personal computer

Use the FTP function in order to write files to a program memory from a personal computer.

1. Create files.

File name	Description
STARTUP.CMD	Script file to load a user program
file.out*1	User program

*1 Use arbitrary file name.

- STARTUP.CMD

```
"//Load the "file.out" file from root directory in the program memory.
ld(1,0,"/0/file.out")
//Generate the "func" function under the default task name (t1). (The "func" function is already included in the file.out file.)
sp(func,0,0,0,0,0,0,0,0,0)
```

2. Power ON C Controller module.
3. Connect the personal computer to C Controller module.
4. Write the files to the program memory by using the FTP function.

The default setting for FTP is as follows.

Item	Default
Login name	target
Password	password

5. Reset C Controller module or turn OFF → ON the power supply.
6. Check that the READY LED starts flashing.

The script file, "STARTUP.CMD" is executed.

7. Check that the READY LED turns ON.

The user program is executed.

Registering from SD memory card

In any of the following cases, files can be copied from an SD memory card to a program memory by using the command in script file.

- A personal computer cannot be connected
- The same user program is registered in more than one C Controller module

1. Create files.

File name	Description
STARTUP.CMD	Script file to copy files to the program memory
STARTUP.ROM*1	Script file to load a user program
file.out*2	User program

*1 Use any file name other than "STARTUP.CMD".

*2 Use arbitrary file name.

- STARTUP.CMD

```
//Copy the user program, "file.out" in the SD memory card to the program memory.
copy("/2/file.out","/0/file.out")
//Rename the operational script file, "STARTUP.ROM" in the SD memory card to "STARTUP.CMD", and copy it to the program memory.
copy("/2/STARTUP.ROM","/0/STARTUP.CMD")
```

- STARTUP.ROM

```
"//Load the "file.out" file from root directory in the program memory.
ld(1,0,"/0/file.out")
//Generate the "func" function under the default task name (t1). (The "func" function is already included file.out file.)
sp(funcA,0,0,0,0,0,0,0,0,0)
```

2. Write the created file to an SD memory card.

3. Insert the SD memory card to C Controller module.

4. Reset C Controller module or turn OFF → ON the power supply.

5. Check that the READY LED starts flashing.

The script file "STARTUP.CMD" in the memory card is started.

6. Check that the READY LED turns ON.

7. Power OFF C Controller module and remove the SD memory card.

8. Power ON C Controller module.

9. Check that the READY LED starts flashing.

The script file "STARTUP.CMD" which has been copied to the program memory is started.

10. Check that the READY LED turns ON.

The user program is executed.

6.14 Troubleshooting

This section explains the contents, causes, and corrective actions of various error which may occur during the system use.
For module-specific troubleshooting, refer to the manual for respective modules.

Point

In case of error occurrence, saving a user program or device status, etc. will be useful for clarifying the factors of the error.
📖 CW Configurator Operating Manual

Troubleshooting procedure

1. Check the LED on Power supply module.
(📖 MELSEC iQ-R C Controller Module User's Manual (Application))
2. Check the LED on C Controller module.
(📖 MELSEC iQ-R C Controller Module User's Manual (Application))
3. Check the LED on respective I/O modules or Intelligent function module. (📖 User's manual for respective modules (Application))
4. Connect CW Configurator, and start the system monitor function. The module which causes error can be confirmed. (☞ Page 64 System monitor)
5. Select the module causing the error, and start the Module Diagnostic function. The cause and corrective actions can be checked. (☞ Page 65 Module diagnostics)
6. If the cause cannot be identified by the Module Diagnostic function, check the operation or error logs with CW Configurator to identify the causes. (☞ Page 66 Event history)
7. If the cause still cannot be identified by the step 1 to 6, perform the troubleshooting by symptom. (📖 User's manual for respective modules (Application))

Checking with CW Configurator

Use CW Configurator to check the errors occurred logs and to identify the cause of the error. Detailed information, cause of error, and corrective actions can be checked.

CW Configurator has the following functions which support troubleshooting.

Function	Description
System monitor	A function to display the module configuration, detailed information for each module, and an error status
Module diagnostics	A function to diagnose the operating status of each module (module information, existence of an error, or error logs, etc.)
Event history	A function to display the event information including error occurred on each module, performed operations, and error on the network

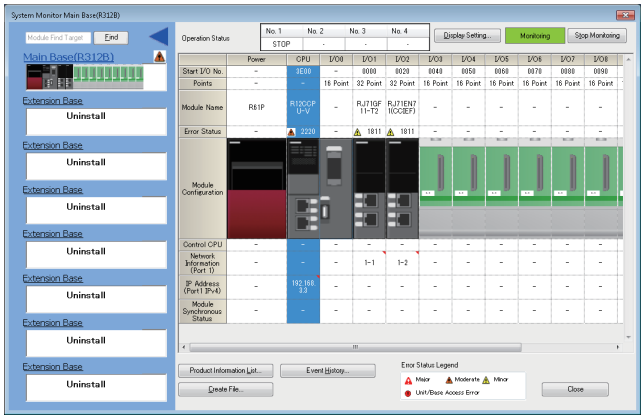
For more details on the functions of CW Configurator, refer to the following manual.

CW Configurator Operating Manual

System monitor

The System Monitor function displays the module configuration, detailed information of each module, and error status.

[Diagnostics] ⇨ [System Monitor]



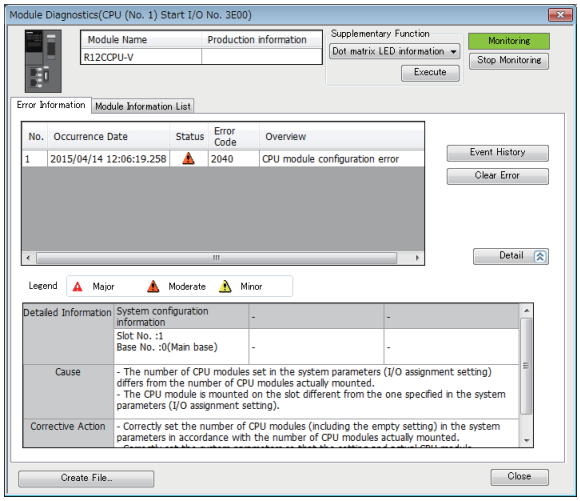
Module diagnostics

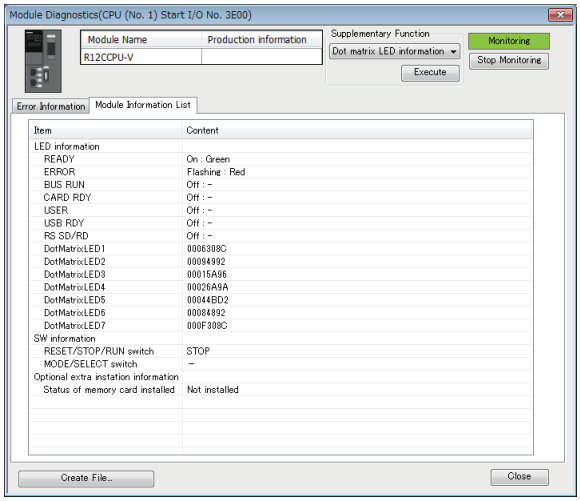
The Module Diagnostic function diagnoses the operating status of each module (module status, existence of an error, or error logs, etc.).

It displays an error occurred, detailed status, causes, and corrective actions, so information necessary for troubleshooting can be checked. In addition, the error part on the parameter can be identified by selecting the error and click the [Error Jump] button.

On the [Module Information List] tab, the current LED information or switch information of the corresponding module can be checked.

Select [Diagnostics] ⇨ [System Monitor], and double click the corresponding module.



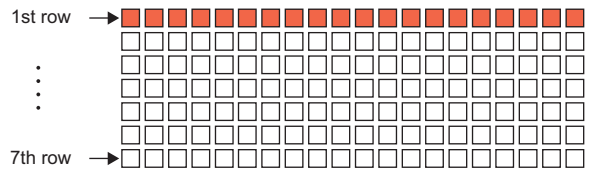


■Dot matrix LED information

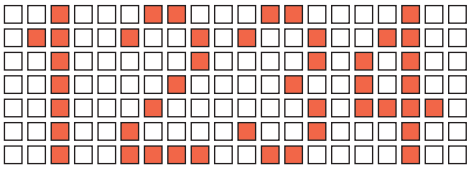
"DotMatrixLED1" to "DotMatrixLED7" under "LED information" indicates the dot matrix LED display status.

The contents are displayed in hexadecimal notation, and the lower 20 bits of each data are valid data.

Item	Content
DotMatrixLED1	Lighting bit data of the 1st row from the top
DotMatrixLED2	Lighting bit data of the 2nd row from the top
DotMatrixLED3	Lighting bit data of the 3rd row from the top
DotMatrixLED4	Lighting bit data of the 4th row from the top
DotMatrixLED5	Lighting bit data of the 5th row from the top
DotMatrixLED6	Lighting bit data of the 6th row from the top
DotMatrixLED7	Lighting bit data of the 7th row from the top



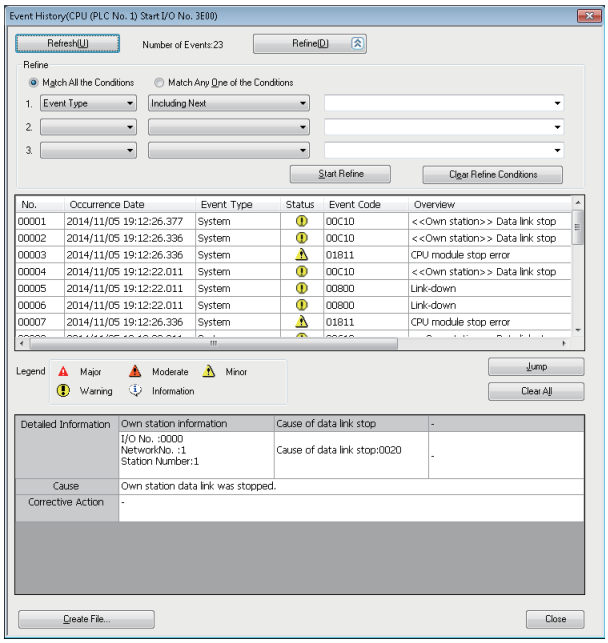
• Display example

Dot matrix LED display	LED information		Lower 20 bits (Binary)				
	DotMatrixLED1	00023184	0010	0011	0001	1000	0100
	DotMatrixLED2	00064A4C	0110	0100	1010	0100	1100
	DotMatrixLED3	00020854	0010	0000	1000	0101	0100
	DotMatrixLED4	00021094	0010	0001	0000	1001	0100
	DotMatrixLED5	0002205E	0010	0010	0000	0101	1110
	DotMatrixLED6	00024244	0010	0100	0010	0100	0100
	DotMatrixLED7	00027984	0010	0111	1001	1000	0100

Event history

The Event History function displays the event information including error occurred on each module, performed operations, and error on the network. Since the information collected before powering OFF or resetting can be saved, it is used to identify the cause of abnormalities from past operations or error occurrence tendency. The displayed information can be saved in CSV file format.

[Diagnostics] ⇨ [System Monitor] ⇨ [Event History] button



Point

The Event History function is used in the following cases.

- For checking error occurrence status for all modules, and clarifying the causes of malfunction which occurred on the facilities/equipment
- For checking when and from where a parameter of a user program has been changed
- For checking if any unauthorized access from a third party has been tried

For more details on the function or information collected with the event history function, refer to the following manual.

MELSEC iQ-R C Controller Module User's Manual (Application)

7 MAINTENANCE AND INSPECTION

This chapter describes items that must be maintained or inspected daily or periodically to use C Controller module properly and in optimal condition at all times.

7.1 Daily Inspection

This section describes items that must be inspected daily.

Item	Inspection item		Inspection method	Acceptance criteria	Corrective action
1	Mounting status of Base unit	Looseness	Check that mounting screws are not loose and the cover is not dislocated.	The Base unit has been securely fixed.	Retighten the screws.
2	Mounting status of a module	Looseness	Check that the module is mounted and the module fixing hook is fixed securely.	The module has been securely mounted.	Fix the module fixing hook securely on the Base unit.
3	Connection status	Terminal screw looseness	Check for the terminal screw looseness.	The terminal screws are not loose.	Retighten the terminal screws.
		Clearance between the solderless terminals	Check for the clearance between the solderless terminals.	The proper clearance has been provided between solderless terminals.	Provide the proper clearance between solderless terminals.
		Connector looseness	Check for the cable connector looseness.	The cable connector is not loose.	Connect the connector without looseness.
4	LED status	POWER LED (Power supply module)	Check the lighting status.	The LED is ON. (Failure if it is OFF)	Troubleshooting by symptom (MELSEC iQ-R C Controller Module User's Manual (Application))
		READY LED	Check the lighting status in the BUS RUN state.	The LED is ON. (Failure if its is OFF)	
		ERROR LED	Check the lighting status.	The LED is OFF. (Failure if it is ON or flashing)	
		Dot matrix LED	Check the lighting status.	The LED turns ON and OFF.	
		I/O indicator LED (I/O module)	Check the lighting status.	I/O signal is ON: The LED is ON. I/O signal is OFF: The LED is OFF.	User's manual (Application) for each module

7.2 Periodic Inspection

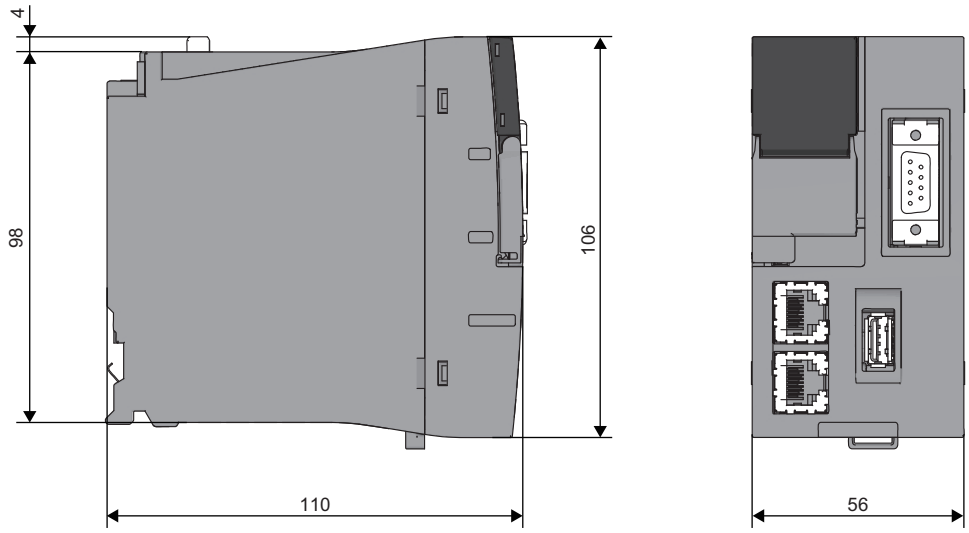
This section describes items that must be inspected once or twice every six months to a year.
Also, check this items when the equipment has been relocated or modified, or wiring layout has been changed.

Item	Inspection item		Inspection method	Acceptance criteria	Corrective action
1	Ambient environment	Ambient temperature	Measure the temperature by using a thermometer.	0 to 55℃	Create the environment that satisfies the acceptance criteria.
		Ambient humidity	Measure the humidity by using a hygrometer.	5 to 95 %RH	
		Atmosphere	Measure corrosive gases.	No corrosive gases.	
2	Power supply voltage check		Measure a voltage between the terminals of 100/200 VAC and 24 VDC.	85 to 264 VAC	Change the power supply.
				15.6 to 31.2 VDC	
3	Mounting status	Looseness and backlash	Touch the module to check for the looseness and rattling.	The module must be mounted securely.	Fix the module with screws. If the module is loose, retighten the screws.
		Attachment of dirt and foreign material	Check visually.	No dirt or foreign material is attached.	Remove any dirt or foreign material.
4	Connection status	Terminal screw looseness	Check for the terminal screw looseness.	The terminal screws are not loose.	Retighten the terminal screws.
		Clearance between the solderless terminals	Check the clearance between the solderless terminals.	The proper clearance has been provided between solderless terminals.	Provide the proper clearance between the solderless terminals.
		Connector looseness	Check for the cable connector looseness.	The cable connector is not loose.	Connect the connector without looseness.

APPENDIX

Appendix 1 External Dimensions

R12CCPU-V



Appendix 2 How to Use MELSEC-Q Series Modules

This section describes how to use MELSEC-Q series modules.

Usable module

For the modules which can be used, refer to the following section.

☞ Page 26 Supported Module List

Window change in CW Configurator

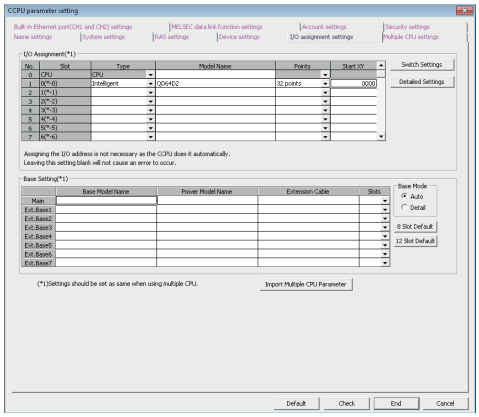
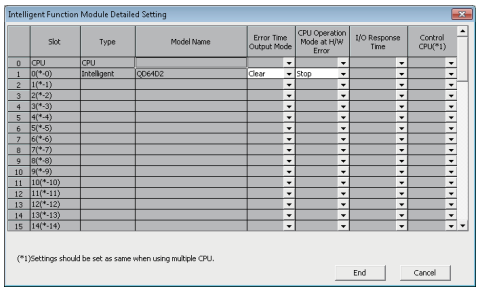
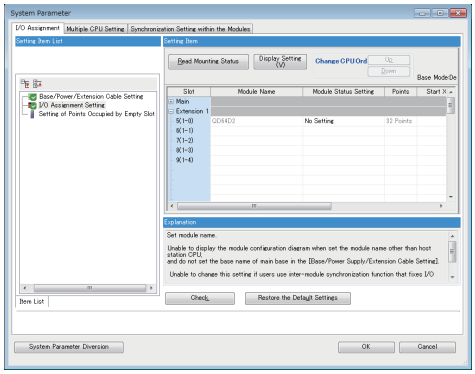
Setting items in Setting/monitoring tools for the C Controller module used for MELSEC-Q series are changed to the following windows in CW Configurator.

Parameter items

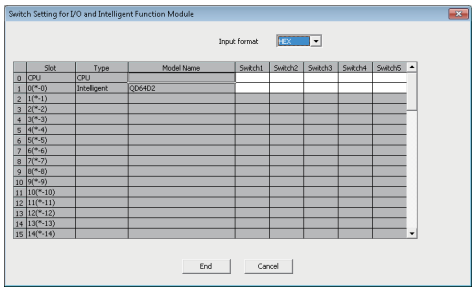
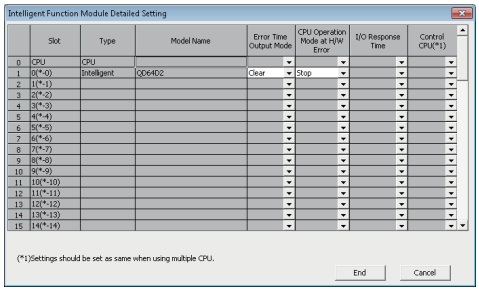
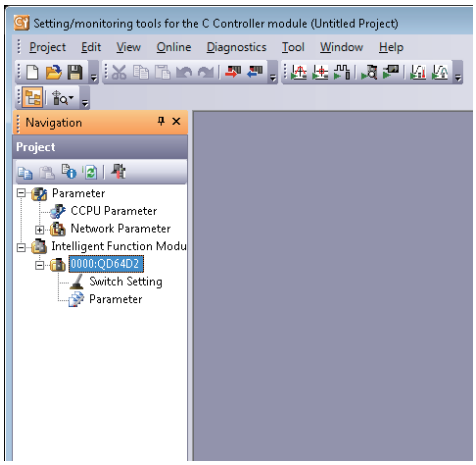
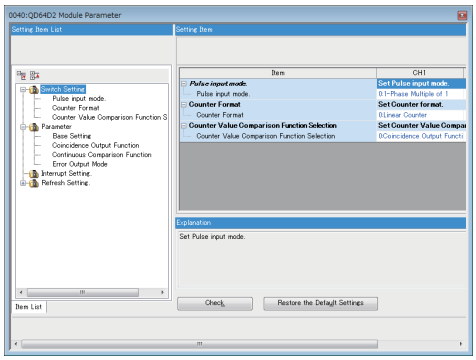
For parameter setting method on CW Configurator, refer to the following manual.

📖 MELSEC iQ-R C Controller Module User's Manual (Application)

■"Points", "Start XY", and "PLC Operation Mode at H/W Error" in "I/O assignment settings"

Setting/monitoring tools for the C Controller module	CW Configurator
Project window ⇨ [CCPU Parameter] ⇨ [I/O assignment settings]  Project window ⇨ [CCPU Parameter] ⇨ [I/O assignment settings] ⇨ [Detailed Settings] 	Navigation window ⇨ [Parameter] ⇨ [System Parameter] ⇨ [I/O Assignment Setting] 

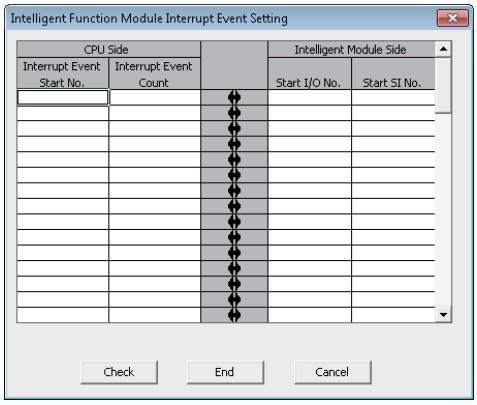
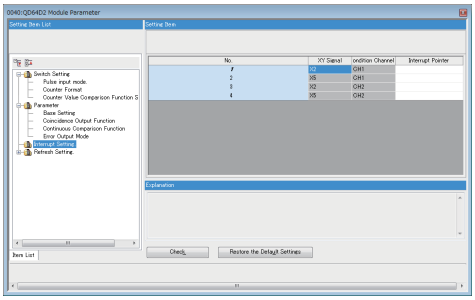
■"Switch Setting" and "Error Time Output Mode" in "I/O assignment setting" , and intelligent function module parameters

Setting/monitoring tools for the C Controller module	CW Configurator
Project window ⇨ [CCPU Parameter] ⇨ [I/O assignment settings] ⇨ [Switch Setting]  Project window ⇨ [CCPU Parameter] ⇨ [I/O assignment settings] ⇨ [Detailed Setting]  Project window ⇨ [Intelligent Function Module] ⇨ [(module model name)]  	Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ (module model name) ⇨ [Module Parameter] 

■Interrupt pointer setting

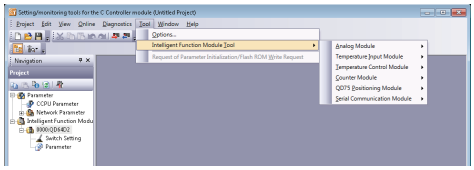
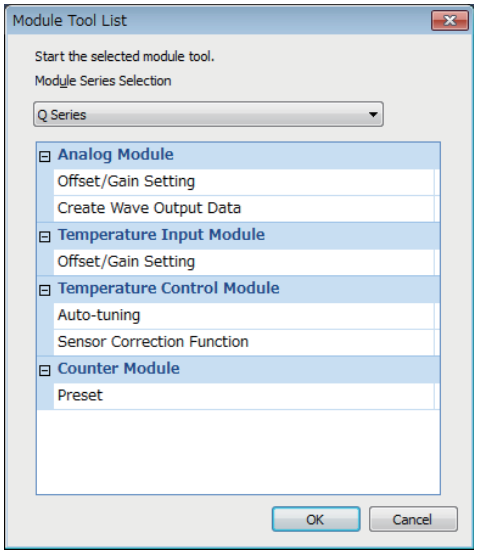
In CW Configurator, the setting for interrupt pointer is changed as follows.

- Setting the SI No. for an interrupt module is not required.
- "Interrupt pointer" of an interrupt module must be sequential numbers. (Set I51 to No.2 and I52 to No.3 when No.1 is set to I50, for example.)

Setting/monitoring tools for the C Controller module	CW Configurator
Project window ⇨ [Parameter] ⇨ [CCPU Parameter] ⇨ [System settings] ⇨ "Intelligent Function Module Setting" ⇨ [Interrupt event settings]	Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ (module model name) ⇨ [Module Parameter]
	

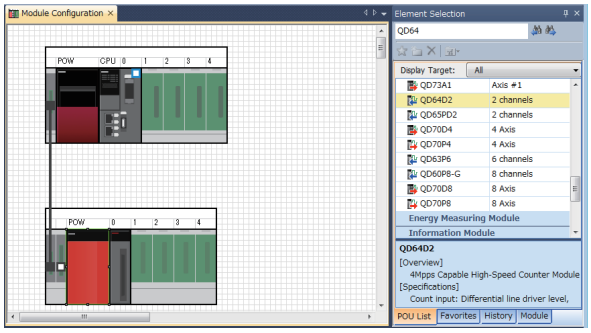
Intelligent function module tool

"Intelligent Function Module Tool" is changed to the window shown below.

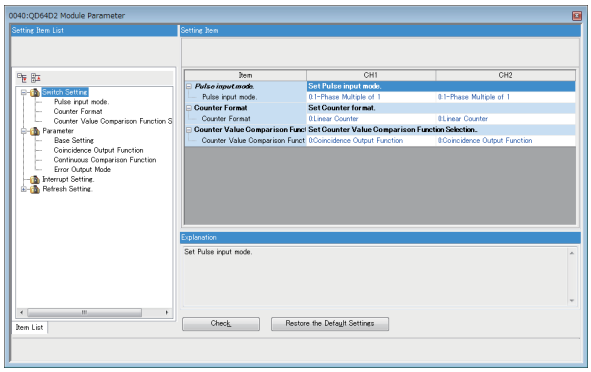
Setting/monitoring tools for the C Controller module	CW Configurator
[Tool] ⇨ [Intelligent Function Module Tool] ⇨ (tool for each module)	[Tool] ⇨ [Module Tool List] ⇨ [Q Series] ⇨ (tool for each module)
	

Setting procedure

The setting procedure for MELSEC-Q series module in CW Configurator is shown below:



1. Create the module configuration in accordance with the actual configuration by dragging each MELSEC-Q series module from the Element Selection window and dropping it on the Module Configuration Diagram.



2. Set the parameters of each module.

Point

- When CW Configurator can be connected to the actual system configuration, the configuration can be read by selecting [Online] ⇨ [Read Module Configuration from PLC]. For modules of which configuration cannot be read, drag each module from the Element Selection window and drop it on the Module Configuration Diagram.
- To change "Points", "Start XY", "Control PLC Settings", or "CPU Module Operation Setting at Error Detected", set the parameters in "System Parameter"

Considerations

The modules requiring particular attentions are shown below.
For details, refer to the manual for the module used.

I/O module

■High-speed input module

- When the module is used as a high-speed input module, select the following model in accordance with the ON/OFF of a noise filter. The module operates with the default setting when the ON/OFF of the noise filter does not correspond to the ON/OFF of the model.

Module model name	Model displayed on CW Configurator	
	Noise filter: ON	Noise filter: OFF
QX40H	QX40H (NoiseF_ON)	QX40H (NoiseF_OFF)
QX70H	QX70H (NoiseF_ON)	QX70H (NoiseF_OFF)
QX80H	QX80H (NoiseF_ON)	QX80H (NoiseF_OFF)
QX90H	QX90H (NoiseF_ON)	QX90H (NoiseF_OFF)

- When the module is used as an interrupt module, select "QI60". The module operates with the default setting when it is used with the noise filter set to OFF.
- When multiple modules are used as an interrupt module, set the number of modules to be used in "I/O Assignment Setting" of the System Parameter.

■Interrupt module

When multiple interrupt modules are used, set the number of modules to be used in "I/O Assignment Setting" of the System Parameter.

High-speed counter module and pulse input module

Check the latest error code with the System Monitor function since error codes for QD63P6 and QD60P8-G cannot be checked with the Module Diagnostic function. When more than one error occurred, refer to the buffer memory.

Positioning module

- Set parameters in a user program because the positioning data parameter cannot be written to the module.
- Check the latest error code with the System Monitor function since error codes for QD70P4, QD70P8, QD70D4, and QD70D8 cannot be checked with the Module Diagnostic function. When more than one error occurred, refer to the buffer memory (error codes for each axis).

Loop control module

Check the latest error code with the System Monitor function since error codes for the Q62HLC cannot be checked with the Module Diagnostic function. When more than one error occurred, refer to the buffer memory.

FL-net interface module

- Select the following model displayed on the Module Configuration Diagram.

Module model name	Model displayed on CW Configurator
QJ71FL71	QJ71FL71(-T -B5)(-F01)
QJ71FL71-F01	
QJ71FL71-B5	
QJ71FL71-B5-F01	
QJ71FL71-T	
QJ71FL71-T-F01	
QJ71FL71-B2	QJ71FL71-B2(-F01)
QJ71FL71-B2-F01	

- Select "Online" for "Operation Mode Setting" of "Switch Setting".
- The size setting of area 1 for the cyclic data set in bit units in Setting/monitoring tools for the C Controller module changes to the setting in word units in CW Configurator.

MODBUS interface module and MODBUS/TCP interface module

- To set "Start MODBUS Device No." of "MODBUS Device Assignment Parameter", check the setting range in the manual in advance.
- For "Basic parameter starting method" and "MODBUS device assignment parameter starting method" of "Switch setting" in "Basic setting", only "Start with the user-set parameters" can be selected. Write a program to set the automatic communication parameters as well as module parameters to which only "Switch Setting" is set in order to start with the default assignment parameters.

AnyWireASLINK master module and AnyWire DB A20 master module

When AnyWire DB A20 master module is used, select the following model displayed on the Module Configuration Diagram.

Module model name	Model displayed on CW Configurator
QJ51AW12D2	MELSEC_Partner

Q series large type extension base unit (AnS series size)

Select the module which can be mounted on the actual each extension base unit on the Module Configuration Diagram. When a Q series large type blank cover is used, select the module mounted on the Q series large type blank cover.

Appendix 3 Handling of Batteries

The battery used for C Controller module is shown below.

Supplied status	Classification for transportation
Lithium battery built into the device	Non-hazardous material

Precautions

The buttery replacement shall be charged. Please consult your local Mitsubishi representative.

Transport guidelines

When transporting lithium-containing butteries, they should be handled in accordance with the transportation regulations. Products are packed in compliance with the transportation regulations prior to shipment. When repacking any of the unpacked products for transportation, make sure to observe the IATA Dangerous Goods Regulations, IMDG (International Maritime Dangerous Goods) Code, and other local transportation regulations. For details, please consult the shipping carrier used.

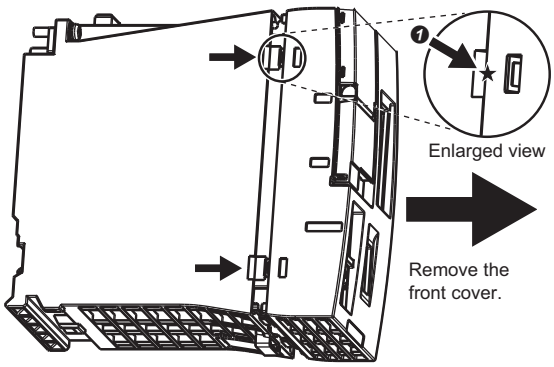
Handling of batteries and devices with built-in batteries in EU member states

For details on handling of batteries in EU member states, refer to the following manual.

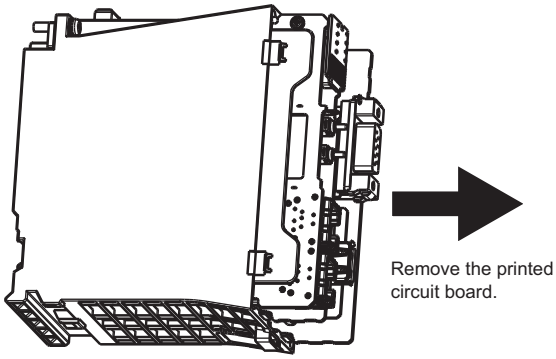
MELSEC iQ-R Module Configuration Manual

Disposal of batteries

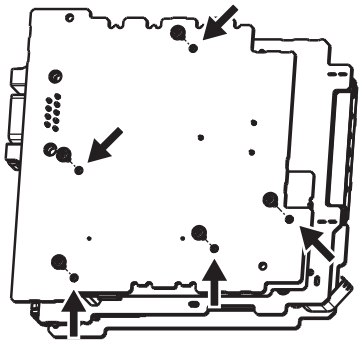
C Controller module has a built-in lithium battery (secondary battery). Prior to disposing of C Controller module, follow the procedure below to dispose of the built-in battery.



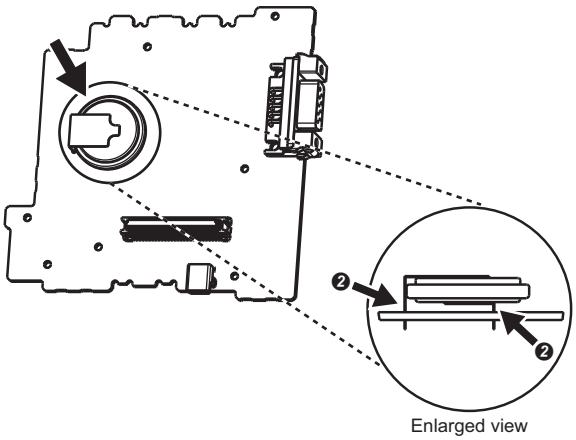
1. Lift the ❶ (★) portion on the side of C Controller module, and remove the front cover.



2. Remove the printed circuit board from the case.



3. Remove five board fixing screws (M2) from the board.
4. Detach the printed circuit board from one another.



Enlarged view

5. Cut off the ❷ (lead) portion of the battery, which is attached on the surface of the printed circuit board with RS-232 connector, using a tool such as nippers, and remove the battery.
6. Dispose of the battery in accordance with the disposal regulations of local governments.

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REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
February 2015	SH(NA)-081367ENG-A	First edition
April 2015	SH(NA)-081367ENG-B	■Added or modified parts Section 3.2, Section 3.5
May 2015	SH(NA)-081367ENG-C	■Added or modified parts COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES, TERMS, Chapter 1, Chapter 2, Section 3.2, Section 3.3, Section 4.3, Section 6.4, Section 6.5, Section 6.10

Japanese manual number: SH-081366-C

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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MODEL CODE: 13JX11

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